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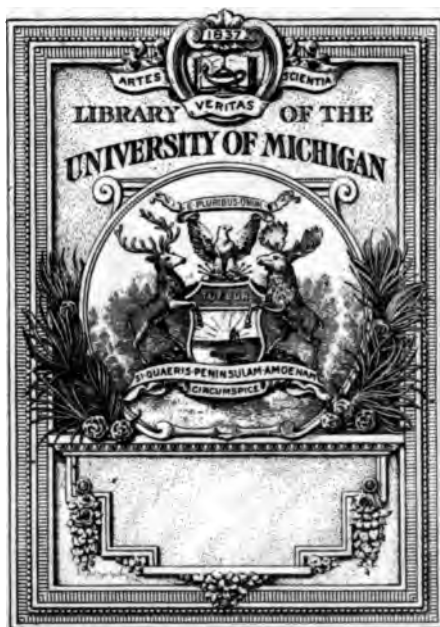
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- Society, Royal, of Gottingen, don. to lib., vii. iii.
- Society, Royal, Academy of Sciences, &c., Belgium, don. to lib., ix.
- Society of Natural Sciences, Neuchatel, don. to lib., x.
- Society, British Ass., for advancement of Science, don. to lib., xi.
- Society of Science, Agriculture and Arts of Lille, don. to lib., xiv.
- Society, Royal, of Edinburgh, don. to lib., xiv.
- Society, Royal, Leopold. Carolin. Acad. Vienna, iii., don. to lib., x.
- Society, Royal Mineralogical, St. Petersburg, iii., don. to lib., viii.
- Society, Natural Hist., Frankfurt a M., don. to lib., vi.
- Society, Nat. Hist., Leipzig, don. to lib., vi. vii.
- Society, Royal Danish, Nat. Hist., don. to lib., vii.
- Society, Nat. Hist., of Marburg, don. to lib., vii.
- Society, Nat. Hist., Basel, don. to lib., vii.
- Society, Royal Gardeners, Berlin, don. to lib., vii.
- Society, Royal Bohemian Nat. Hist., don. to lib., viii.
- Society, Wurtemberg Nat. Hist., don. to lib., viii.
- Society, Royal Acad. of Naturalists, don. to lib., viii.
- Society, Nat. Hist., of Westphalia, don. to lib., viii. x.
- Society, Nat. Hist., of Emden, don. to lib., viii. x.
- Society, Lombardy Institute, don. to lib., v.*
- Society of Nat. Hist., Zurich, don. to lib., v.* vii.
- Society of Nat. Hist., Duchy of Nassau, don. to lib., v.*
- Society, Entomological, Stettin, don. to lib., v.*
- Society, Nat. Hist., Netherland India, lib., vii.*
- Society, Nat. Hist., Danzig, don. to lib., viii.
- Society, Nat. Hist., Hamburg, don. to lib., x.
- Strain, Lieut. J. C., death of, 150.
- Taliaferro, Dr., don. to mus., i.
- Tarbé, Prosper, don. to mus., i.
- Taylor, Wm. J., Aluminium, the progress in its manipulation, 1; investigation of the Rock Guano of the islands of the Carribbean Sea, 75; examination of a Nickel Meteorite, 101; examination of Enargite, 150; don. to mus., ii.
- Thornton, S. C., don. to mus., viii.
- Tiffany, Mr., don. to mus., vi.
- Torrey, Prof. John, don. to mus., iv.
- Totten, Col. G. M., don. to mus., viii.
- Tröschel, Dr., don. to lib., vii.*
- Turner, Dr. Thos. J., don. to mus., v.
- Tyson, J. R., don. to lib., i. vi.
- Uhler, Philip R., contributions to the Neuropterology of the U. States, 73.
- Uhler, Dr. W. H., don. to mus., i. ii. iv. vi.
- Van Leeuwen, J., don. to lib., viii.
- Vaux, Wm. S., don. to lib., xiv.; don. to mus., iii.
- Vreeland, Dr. B., don. to mus., ii.
- Watson, Joseph, don. to mus., viii.
- Wayne, Major, U. S. A., remarks on camels in U. States, 206.
- Weitenweber, Dr. W. R., don. to lib., viii.
- Wheatley, C. M., don. to mus., iii.
- Wilson, Dr. T. B., don. to lib., i. ii. iii. iv. v. vi. vii. v.* vi.* vii.* viii.* ix. x. xi. xii. xiii. xiv.; don. to mus., i. ii. iv. v. vi.
- Wilson, Jr., Dr. Jos., U. S. N., don. to mus., iv. vi.
- Willis, B. B., don. to mus., vi.
- Woodhouse, Dr. S. W., don. to mus., ii. iii. iv. vi.
- Wood, Wm. S., don. to mus., ii.
- Wood, C., don. to mus., iv.
- Wood, W. W., don. to mus., vi.
- Yardley, F. W., don. to mus., viii.

PROCEEDINGS
OF THE
ACADEMY OF NATURAL SCIENCES
OF PHILADELPHIA.



1857.

January 20th.

COL. M'CALL in the Chair.

Communications intended for publication in the Proceedings were presented, entitled :

Catalogue of the species of *Bembidium* found in the United States and contiguous northern regions. By John L. LeConte, M. D.

Index to the Buprestidae of the United States, described in the work of Laporte and Gory, with notes. By John L. LeConte, M. D.

Description of several new Mammals, from Western Africa. By John LeConte.

Aluminium ; the progress in its manipulation. W. J. Taylor.

Catalogue of birds collected by P. B. Du Chaillu, on the river Muni, Western Africa, with descriptions of new species. By John Cassin.

Which were severally referred to Committees.

On leave granted, Dr. Leidy introduced a memorial to Congress, praying that a report be ordered to be prepared on the collections of Natural History, recently made by the North Pacific Exploring Expedition, under Com. Rodgers ; which was referred to a Committee with power to act.

January 27th.

Vice-President BRIDGES in the Chair.

The Annual Report of the Publication Committee was read and adopted.

In accordance with the By-laws, an election for members of the standing Committees for the present year was held, with the following result :—

Ethnology.

J. Aitken Meigs, S. S. Haldeman, T. G. Morton.

Comparative Anatomy and General Zoology.

Joseph Leidy, Jas. M. Corse, W. H. Gobrecht.

Mammalogy.

John LeConte, Geo. A. M'Call, Wm. Camac.

Ornithology.

John Cassin, Geo. A. M'Call, S. W. Woodhouse.

Herpetology and Ichthyology.

Edw. Hallowell, R. Bridges, J. C. Morris.

Conchology.

T. A. Conrad, T. B. Wilson, W. G. Binney.

Entomology and Crustacea.

R. Bridges, John A. Guex, F. Schafhirt.

Botany.

E. Durand, S. S. Garrigues, A. J. Brasier.

Geology.

Isaac Lea, Chas. E. Smith, John L. LeConte.

Mineralogy.

W. S. Vaux, S. Ashmead, F. A. Genth.

Palæontology.

T. B. Wilson, Joseph Leidy, T. A. Conrad.

Physics.

B. H. Rand, Fairman Rogers, W. M. Uhler.

Library.

W. S. Vaux, R. Pearsall, Joseph Jeanes.

Proceedings.

J. Aitkin Meigs, Joseph Leidy, Geo. A. M'Call.

The following papers, on report of the Committees to which they had been referred, were ordered to be published in the Proceedings.

Catalogue of the species of *HEMBIDIUM* found in the United States and contiguous Northern Regions.

BY JOHN L. LECONTE, M. D.

On revising recently my collection of the species of the genus named above, I regretted to find, that in former years I had been led to describe as distinct species, many which a more practiced eye now leads me to consider as varieties. The number, also, of well-defined species, being very great, I have thought it important to attempt to separate them into definite groups, which, by containing a comparatively small number of species, would facilitate the subsequent labors of the student endeavoring to identify his specimens.

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With this object in view, I sought the divisions established by Jacquelin Du Val, in his admirable treatise "*De Bembidiis Europaeis*"* among our own species, but was much disappointed to find them not at all applicable. After repeated trials to reduce a system on the characters of Du Val, which should present a natural series when applied to the species before me, I was at length compelled to adopt another method of division, the result of which is presented below.

But first with regard to the limits of *Ochthedromus* Lec. and its claims to regard as a natural genus. European entomologists have thus far refused to place it in their system, adhering to the view that the subulipalate Carabica, with few exceptions, (Anillus is received by all, *Thalassobius* and *Tachypus* by a few) form but one great genus *Bembidium*. From this view I ventured to dissent many years ago, but more distinctly in my notes on the classification of the Carabidae of the United States,* where the *Trechi* and *Bembidia* were widely separated on a difference in the mesothoracic parapleuræ; these in the former are divided by a suture near the posterior margin, and in the latter by a diagonal suture. I also found that in the *Trechi* the marginal stria of the elytra was interrupted at the middle, while in the *Bembidia* it was entire. Renewed observation has confirmed the result then obtained, and has induced me still farther to enlarge the group of *Trechi*, by adding to it not only *Tachys*, but also *Anillus*, the form recognized by me as *Blemus*, (which is probably not genuine *Blemus*), and *Lymnæum*, which has been found on the coast of California, at San Diego.

Thus of the genera in my table (loc. cit. 397) there remains only *Pericompso*, *Bembidium*, *Ochthedromus*, *Hydrium*, and *Patrobus*. The last named genus must form a group by itself, or at least separate from *Bembidium*, and more nearly allied to *Pterostichus*, or *Platynus*. *Hydrium* does not appear to be sufficiently definite to be retained.

Of the three genera thus retained, *Pericompso* is known by the anterior tarsi of the male being hardly or not at all dilated, by the anterior tibiae being obliquely truncate at tip, and by the elytra being without scutellar striae: the mentum tooth is small and acute. *Bembidium* and *Ochthedromus* differ from *Pericompso* only by the male having two joints of the anterior tarsi dilated, by the anterior tibiae being somewhat rounded at tip, and by the elytra having a short scutellar stria. They differ among themselves by the comparative size of the middle portion of the mentum, which in the species with impressed square spots is longer and broader than in the others, and also in the comparatively larger size of the first dilated joint of the anterior tarsi in the same species. Nevertheless, taking into account the great variations in character, especially of the mentum, in other groups, it seems to me more natural again to unite them into one genus, to be called *Bembidium*. And with a view of shewing the relations between the different groups, the following table may be made use of.

BEMBIDIUM Latr.

Legio Ima. Elytra humeris subangulatis, stria 8va a margine remota, interstitio 3io punctigero.

A. Mentum dente brevi bicuspi; elytra striis abbreviatis.

I. Elytra interstitiis seriatim parce punctatis, setiferis. (*Hydrium* Lec.)

II. Elytra glabra, interstitio 3io bipunctato. (*Eudromus* Kirby.)

B. Mentum dente magno, integro: elytra striis integerrimis.

III. Elytra interstitio 3io bipunctato et foveis quadratis impresso. (*Bembidium* Lec.)

IV. Elytra interstitio 3io bipunctato, haud foveato.

* Annales de la Soc. Entom. de France, 2nd Ser. 9, 462.

† Trans. Am. Phil. Soc. vol. x, 379.

Legio 2nda. Elytrorum stria 3ia bipunctata :

A. Stria 8va ad marginem modice approximata.

V. Elytra humeris subangulatis, stria 5ta ad apicem extensa.

Elytra humeris rotundatis, striis antice fortiter punctatis, 5ta vel 7ma ad apicem extensa :

VI. Subdepressa, elytrorum striis integris vel postice parum oblitteratis.

VII. Convexa, elytrorum striis postice valde oblitteratis.

B. Stria 8va ad marginem valde approximata ; humeris rotundatis.

VIII. Thorax planus trapezoideus, utrinque ad basin bifoveatus ; elytra tenuiter striata ; antennæ et pedes nigri.

IX. Thorax planus trapezoideus, ad basin late foveatus (vel vix bifoveatus), fovea externa minuta ; elytra striis profundis sæpe abbreviatis ; antennarum basis et pedes testacei. (Peryphus p.)

X. Thorax convexus subcordatus, fovea basali externa brevior ; elytra striis profundis sæpe abbreviatis ; antennarum basis et pedes præcipue testacei, raro nigri. (Peryphus p.)

Legio 3ia. Elytra humeris rotundatis, interstitio 3io punctigero.

A. Linea humerali haud hamata.

a. Striæ frontales normales ; striæ elytrorum nonnullæ integræ, (8va ad marginem approximata).

XI. Elytra interstitio 3io tripunctato.

XII. Elytra interstitio 3io bipunctato.

‡ Caput subtilissime granulatum.

‡‡ Caput nitidum læve.

b. Striæ frontales convergentes, vel sæpe duplices ; elytrorum omnes dorsales abbreviatæ.

XIII. Striæ frontales duplices integræ vix convergentes ; thorax cordatus truncatus, angulis posticis carinatis.

XIV. Striæ frontales duplices obliquæ, exteriore interrupta ; thorax cordatus truncatus, angulis posticis carinatis.

XV. Striæ frontales duplices obliquæ, exteriore interrupta ; thorax cordatus pedunculatus, angulis posticis minutis haud carinatis.

XVI. Striæ frontales obliquæ antice conniventes ; thorax cordatus truncatus, angulis posticis carinatis.

c. Striæ frontales normales ; elytrorum omnes abbreviatæ.

XVII. Thorax cordatus ; elytrorum interstitio 3io bipunctato.

XVIII. Thorax cordatus ; elytra interstitiis seriatim punctatis.

B. Linea humerali hamata, cum stria 5ta coniuncta, hac integra.

XIX. Thorax trapezoideus, angulis posticis carinatis, elytris iridescentibus.

Catalogue of Species.

I. 1. *B. lævigatum* Say.

II. 2. *Eudromus nitidus* Kirby.

III. 3. *B. punctato-striatum* Say ; *stigmaticum* Dej. ; ? *sigillare* Say.
4. *B. impressum* Gyll. Kirby ; *Carabus impressus* Fabr. 5. *B. paludosum* Sturm, Lec. ; *lacustre* Lec. 6. *B. inaequale* Say ; *arenarium* Dej.

IV. 7. *Odontium carinatum* Lec. 8. *B. coxendix* Say ; *nitidulum* Dej.

V. 9. *Ochth. bifossulatus* Lec. 10. *B. americanum* Dej. 11.

Ochth. dilatatus Lec. 12. *B. antiquum* Dej. ; ? *honestum* Say ; var. *Ochth. basalis* Lec. 13. *B. chalcæum* Dej.

VI. 14. *Ochth. salebratus* Lec. ; var. *O. purpurascens* Lec. 15. *O. longulus* Lec. ; var. *O. subaeneus* Lec.

VII. 16. *B. nigrum* Say.

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- VIII. 17. *Ochth. planatus* Lec. 18. *O. simplex* Lec. 19. *B. planiusculum* Mann. 20. *Peryphus complanulus* Mann. 21. *B. incertum* Mann.; *Notaphus incertus* Motsch. 22. *Peryph. tetraglyptus* Mann.
- IX. 23. *Ochth. fugax* Lec.; *O. planipennis* Lec. 24. *Peryphus planus* Hald. 25. *O. perspicuus* Lec. 26. *B. transversale* Dej.; var. *O. compar* Lec. 27. *O. Mannerheimi* Lec.; *B. transversale* Mann. 28. *B. lugubre* Lec. (infra).
- X. 2. Antennarum basis et pedes testacei vel rufi. 29. *Ochth. striola* Lec. 30. *Peryph. bimaculatus* Kirby. 31. *Ochth. lucidus* Lec.; var. *O. substrictus* Lec. 32. *B. rupestre* Dej.; *Carabus rup.* Fabr.; *B. tetracolum* Say; *Peryph. rupicola* Kirby.; 'Carabus Andreez Fabr.' Er. 'Carabus ustulatus Linn.' fide DuVal. 33. *B. postremum* Say; *P. scopulinus* Kirby. 34. *Peryph. picipes* Kirby. 35. *Ochth. gelidus* Lec. Many of this group have a very wide distribution, and No. 32 is even found upon both continents.
- X. 3. Antennarum basis et pedes toti nigri. 36. *Ochth. aratus* Lec. 37. *Ochth. nitens* Lec.; *Peryph. picipes* Mann. The latter is found at Lake Superior and in Russian America.
- XI. 38. *Ochth. sexpunctatus* Lec.
- XII. 2. Caput subopacum, subtilissime granulatum. 39. *Ochth. insulatus* Lec. 40. *O. cordatus* Lec. 41. *O. laticollis* Lec. 42. *B. nigripes* Mann.; *Notaphus nigripes* Kirby. 43. *O. approximatus* Lec.; var. *O. consentaneus* Lec. 44. *B. indistinctum* Dej. 45. *B. fraternum* Lec. (infra). 46. *Notaphus viridicollis* Féré. 47. *B. dorsale* Say. 48. *O. umbratus* Lec. 49. *O. tessellatus* Lec. 50. *B. patrulele* Dej. 51. *O. æneicollis* Lec. 52. *B. variegatum* Say; var. *Not. posticus* Hald. 53. *O. rapidus* Lec. 54. *O. versicolor* Lec.; *Not. variegatus* Kirby. 55. *O. timidus* Lec. 56. *O. pictus* Lec. 57. *B. contractum* Say, Dej.; var. *O. constrictus* Lec.
- XII. 3. Caput nitidum læve. 58. *Ochth. ephippiger* Lec. 59. *O. grandicollis* Lec. 60. *O. vilis* Lec.
- XIII. 61. *Ochth. sulcatus* Lec.; *trepidus* Lec.
- XIV. 2. Antennarum basis pedesque testacei. 62. *B. affine* Say.; *fallax* Dej.; *decepiens* Dej.
- XIV. 3. Antennarum basis pedesque nigri. 63. *O. dubitans* Lec. 64. *O. cruralis* Lec.
- XV. 65. *O. axillaris* Lec. 66. *B. quadrimaculatum* Gyll.; *oppositum* Say; *Cicindela 4-maculatum* Linn. 67. *B. pedicellatum* Lec. (infra.)
- XVI. 68. *Ochth. angulifer* Lec. 69. *O. connivens* Lec. 70. *O. cautus* Lec. 71. *O. frontalis* Lec.
- XVII. 72. *Ochth. mundus* Lec.
- XVIII. 78. *Leia semistriata* Hald.
- XIX. 74. *Ochth. trechiformis* Lec. 75. *O. iridescens* Lec.

Species unknown to me.

- VII. 2. *Bemb. breve* Mann.; *Peryphus brevis* Motsch. Perhaps belongs to II.
- VIII. *Bemb. Kuprianovii* Mann. *B. biimpressum* Mann. *B. quadrifoveolatum* Mann.
- X. 3. *Peryphus concolor* Kirby.
- XII. 2. *Bemb. undulatum* Sturm, (fide Mann. Bull. Mosc. 1853). *Notaph. quadraticollis* Mann.
- XIII. *Bemb. fortistriatum* Mann.; *Omala fortistriata* Motsch. Perhaps not different from *B. sulcatus* Lec., which is found at Lake Superior.

Bemb. glabriusculum Mann. Bull. Mosc. 1853, cannot be referred to any of the divisions above defined.

The following two species described by Kirby, (Fauna Bor. Am. 4) are probably identical with some above named. *Peryphus sordidus* (perhaps No. 30); *Notaphus intermedius*.

The following are not recognisable, owing to the imperfection of the characters given: *Peryphus concolor* Motsch. (Carab. Russ. 9.) *P. erosus* Motsch. (ibid. 10). *Lopha bifasciata* Motsch. (ibid. 12). *Omalia polita* Motsch. (Bull. Mosc. 1845, 1, 29) perhaps is *B. angulifer* Lec. (No. 68.)

Descriptions of new species.

28. *B. lugubre*, subdepressum, nigrum obscure virescens, thorace latitudine paulo breviori, lateribus rotundatis, postice oblique angustato, marginato, ad basin truncato, angulis posticis subrectis haud rotundatis, fovea utrinque basali profunda parce punctata, elytris striis parum impressis antice punctatis, postice oblitteratis, 3ia bipunctata, 7ma haud conspicua, ad apicem obsolete piceis; subtus nigrum, antennarum basi, palpis pedibusque rufis. Long. .28.

One specimen collected by Mr. Schott in the valley of the Rio Grande. Of the same size as *B. transversale*, but with the thorax smaller and more narrowed behind; the striae of the elytra are less impressed, and the 7th is altogether wanting.

45. *B. fraternum*, depressum, obscure æneo-olivaceum, capite thoraceque subtilissime granulatis, hoc latitudine paulo breviori, postice subangustato, lateribus rotundatis postice breviter sinuatis, angulis rectis carinatis, basi utrinque bistriato, haud punctato, elytris striis ante medium fere fortiter punctatis, versus apicem suboblitteratis, 5ta ad apicem extensa; interstitiis planis, 3io bipunctato; fasciis duabus undulatis solitis angustis interruptis apiceque testaceis, antennarum articulo 1mo pedibusque rufis. Long. .18.

One specimen found by me in Habersham County, Georgia. The thorax is formed nearly as in *B. viridicolle*, and is narrower and more sinuate on the sides than in *B. patrule*; from both species it is distinguished by the striae of the elytra being almost obliterated towards the tip, but tolerably strongly punctured at base.

67. *B. pedicellatum*, æneo-nigrum, convexum, nitidum, thorace cordato, latitudine breviori, postice maxime angustato, angulis posticis minutis, ad basin pedunculato, marginato, utrinque fovea minuta impresso, elytris punctis majusculis striatis, pone medium lævigatis, macula triangulari pallida magna humerali utrinque ornatis, antennis palpis pedibusque testaceis. Long. .12.

One specimen found in Lancaster Co., Pennsylvania, by Mr. S. S. Rathvon. Of the same form and size as *B. 4-maculatum*, but the elytra are more strongly punctured, and the posterior pale elytral spot (as in *B. axillare*) is entirely wanting. Six joints of the antennæ that remain, are of a uniform reddish yellow.

Index to the BUPRESTIDÆ of the United States, described in the work of Laporte and Gory, with notes.

BY JOHN L. LECORTE, M. D.

Having recently procured, after many exertions, a complete copy of the *Histoire Naturelle et Iconographie des Insectes Coléoptères*, by MM. Laporte and Gory, I have thought that a catalogue of the native species of Buprestidæ described in the work, which has heretofore been inaccessible to the American student, would, perhaps, tend to the more easy recognition of many of our species. In consequence of the confusion which now reigns among the genera of the family mentioned, the time is not yet propitious for a synopsis of all the native species; but with the appearance of the fourth volume of Lacordaire's work on the Genera of Coleoptera, this difficulty will be removed, and the real

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characters of the misconceived and wrongly described genera now mentioned in the books will be recognized. In the meantime, however, the synonymical aid to be derived from reference to the monograph of Laporte and Gory must not be overlooked.

The dates of publication are as follows: vol. 1; 1837: vols. 2 and 4; 1841.

ACMÆODERA Esch.

1. *A. flavomarginata* Gray, L. & G. 1, 2; tab. 1, 2. (Guatemala); Texas.
2. *A. ornata* L. & G. 1, 6; tab. 2, 7.
3. *A. volvulus* (Fabr.) L. & G. 1, 6; tab. 3, 8. *B. pulchella* Herbst, Say. The locality is incorrectly given as Columbia.
4. *A. tubulus* (Fabr.) L. & G. 1, 11; tab. 3, 15. *B. culta* Weber; *B. geranii* Harris. The locality is misplaced as in the preceding.
5. *A. flavosignata* L. & G. 4, 30; tab. 6, 28. Certainly a variety of No. 3.
6. *A. dispar* L. & G. 4, 31; tab. 6, 29. Perhaps a variety of the preceding.

APATURA Lap. & Gory.

1. *A. Drummondi* Kirby; L. & G. 1, 3; tab. 1, 3. Oregon and California. The species from Siberia considered by Mannerheim as identical, is on comparison seen to be quite distinct.
2. *A. octospilota* L. & G. 1, 4; tab. 1, 4. This is merely a variety of *A. crosso-signata* with large spots.
3. *A. notata* L. & G. 1, 4; tab. 1, 5.
4. *A. crosso-signata* L. & G. 1, 5; tab. 1, 9. Lake Superior and Middle States.
5. *A. decolorata* L. & G. 1, 5; tab. 1, 7. This is merely an unspotted variety of the preceding.
6. *A. caudata* L. & G. 1, 8; tab. 2, 13. This species is unknown to me: the figure somewhat resembles *Dicerca lurida*, and presents rows of punctures not mentioned in the description.
7. *A. appendiculata* L. & G. 1, 8; tab. 2, 14, is *Buprestis longipes* Say; the posterior angles of the thorax in the American specimens are less prominently rectangular, and the sides are less perceptibly sinuate than in those from Europe, but the difference appears one rather of race than species.

BUPRESTIS Linn.

1. *B. liberta* L. & G. 2, 11; tab. 2, 6. Not *B. liberta* Germar, but a species not yet named from the Southern States, *B. Georgiana* Lec.
2. *B. virginienensis* Herbst, L. & G. 2, 11; tab. 2, 7.
3. *B. borealis* L. & G. 2, 13; tab. 3, 9. This is the true *B. liberta* Germ.
4. *B. substrigosa* L. & G. 2, 13; tab. 3, 10. This is *B. campestris* Say; *Chalcophora Langeri* Chev.
5. *B. Drummondi* L. & G. 2, 37; tab. 9, 44; from Mexico, is perhaps *Dicerca Woodhousei*, valens or *Webbii* Lec.; the two last named are described in the Report on the U. S. and Mexican Boundary, not yet published.
6. *B. clara* L. & G. 2, 41; tab. 10, 50. "Amerique boreale." Unknown to me; certainly not from the U. States.
7. *B. punctulata* Schönh. L. & G. 2, 99; tab. 25, 134. *B. transversa* Say.
8. *B. tuberculata* L. & G. 2, 99; tab. 25, 135. *B. scobina* Chev.
9. *B. pugionata* L. & G. 2, 99; tab. 26, 136. Not at all *B. pugionata* Germ.; it is named in my collection *Dicerca lepidæ*.
10. *B. obscura* Fabr. L. & G. 2, 103; tab. 26, 141. *B. baltimorensis* Herbst.
11. *B. consimilis* L. & G. 2, 104; tab. 27, 142. This figure is very similar to that of *B. costicollis*, but the description is valueless.
12. *B. asperata* L. & G. 2, 105; tab. 27, 142. *Dicerca chrysea* Mels.; *D. molitor* Mels.
13. *B. lurida* Fabr. L. & G. 2, 105; tab. 27, 144.
14. *B. sexnotata* L. & G. 2, 129, tab. 32, 178. A very bright colored variety of *B. maculiventris* Say.

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- 14'. *B. magica* L. & G. 2, 138; tab. 34, 189. A Brazilian species; a specimen imported into Massachusetts is the *B. coronata* Harris, Cat. Ins. Mass.
15. *B. rufipes* Fabr. L. & G. 2, 139; tab. 34, 191.
16. *B. lineata* Fabr. L. & G. 2, 143; tab. 35, 196.
17. *B. fasciata* Fabr. L. & G. 2, 144; tab. 35, 193.
18. *B. decora* Fabr. L. & G. 2, 145; tab. 36, 199.
19. *B. aurulenta* Linn. L. & G. 2, 146; tab. 36, 200. Appears to be a bright colored variety of *B. striata*.
20. *B. Bosci* L. & G. 2, 146; tab. 36, 201.
21. *B. striata* Fabr. L. & G. 2, 147; tab. 37, 202.
22. *B. impedita* Say, L. & G. 2, 148; tab. 26, 203. An elongate variety of *B. striata*.
23. *B. ornata* Gory, 4, 93; tab. 16, 90. Undoubtedly not found in the United States.
24. *B. Lecontei* Gory, 4, 107; tab. 18, 104. A species of *Dicerca* from Georgia, but unknown to me.
25. *B. sprete* Gory, 4, 108; tab. 19, 105. *Dicerca impressifrons* Mels.
25. *B. pruinosa* Gory, 4, 109; tab. 19, 106. A *Dicerca*, unknown to me; said to be from New Orleans.
26. *B. costicollis* Gory, 4, 109; tab. 19, 107. Also a *Dicerca* described previously as *B. thureura* Say.
27. *B. erecta* Gory, 4, 110; tab. 19, 108. ? *B. divaricata* Say; *Dicerca aurichalcea* Mels.; *D. parumpunctata* Mels.
28. *B. rusticorum* Kirby; Gory, 4, 117; tab. 20, 115. A species of *Ancylochira* found in Oregon and California, very similar to *A. maculiventris*.
29. *B. maculipennis* Gory, 4, 119; tab. 21, 117. This is most probably a variety of *Ancylochira lineata*; it was subsequently described as *A. inconstans* Mels.
30. *B. consularis* Gory, 5, 120; tab. 21, 118. An *Ancylochira* previously described as *B. Nuttalli* Kirby.
31. *B. erythropus* Gory, 4, 126; tab. 22, 124. Unknown to me; probably from tropical America.

POLYCESTA Serville.

1. *P. Velasco* L. & G. 2, 6; tab. 1, 7. Mexican, but recently found in Texas.

CHRYSOBOTHRIIS Esch.

1. *C. ultramarina* L. & G. 2, 13; tab. 3, 19. Does not in the least resemble *B. ultramarina* Say, which is an *Ancylochira* closely allied to *B. decora* Fabr. The present species must be called *C. azurea*, the name it bears in Dejean's Catalogue.
2. *C. thoracica* (Fabr.) L. & G. 2, 14; tab. 3, 20. This species is unknown to me, if it is not a variety of the preceding.
3. *C. hybernata* (Fabr.) L. & G. 2, 16; tab. 4, 24. Unknown to me if not a variety of the next.
4. *C. viridipunctata* L. & G. 2, 21; tab. 4, 31. Commonly considered as *B. hybernata* Fabr., and agrees with the description of that author.
5. *C. atabalipa* L. & G. 2, 43; tab. 8, 60. Mexican, but found abundantly in Texas.
6. *C. quadriimpressa* L. & G. 2, 48; tab. 9, 64. Our most common species, and usually considered *B. femorata* Fabr.; *C. rugosiceps* Mels. is a variety.
7. *C. femorata* L. & G. 2, 48; tab. 9, 65. A large species named *C. calcarata* in my collection.
8. *C. Lesueuri* L. & G. 2, 49; tab. 9, 66. Cannot be identified with certainty.
9. *C. Germari* L. & G. 2, 50; tab. 9, 67. Perhaps a variety of the next, but cannot be certainly determined.
10. *C. ignipes* L. & G. 2, 50; tab. 9, 68.
11. *C. dentipes* L. & G. 2, 52; tab. 9, 70. Not Germar's species, but probably a variety of *C. femorata* (*C. quadriimpressa* L. & G.)

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12. *C. scabripennis* L. & G. 2, 53; tab. 9, 71.
13. *C. pusilla* L. & G. 2, 53; tab. 10, 72.
14. *C. nigritula* L. & G. 2, 54; tab. 10, 73.
15. *C. posticalis* L. & G. 2, 56; tab. 10, 76.
16. *C. planata* L. & G. 2, 56; tab. 10, 77. Commonly considered as *C. dentipes* Germ.
17. *C. scitula* Gory, 4, 160; tab. 27, 155. Perhaps a variety of the next.
18. *C. chlorocephala* Gory, 4, 161; tab. 27, 156. *B. Harrisii* Hentz.
19. *C. errans* Gory, 4, 172; tab. 28, 167. Unknown to me.
20. *C. rugosula* Gory, 4, 177; tab. 30, 172. Unknown to me.
21. *C. floricola* Gory, 4, 179; tab. 30, 175.
22. *C. dissimilis* Gory, 4, 181; tab. 31, 177. Not identified.
23. *C. Alabamae* Gory, 4, 185; tab. 32, 183. A large not uncommon species.

AGRILUS Lap. & Gory.

1. *A. latebrus* L. & G. 2, 38; tab. 9, 50. Unknown to me if different from *A. acutipennis*.
2. *A. ruficollis* (Fabr.) L. & G. 2, 60; tab. 13, 78.
3. *A. difficilis* Gory, 4, 224; tab. 37, 215. *A. occidentalis* Uhler, Proc. Acad. Nat. Sc. 7, 416.
4. *A. acutipennis* Mann. Enum. Buprestides, 109; Gory, 4, 225; tab. 37, 216.
5. *A. anxius* Gory, 4, 226; tab. 37, 217.
6. *A. quadriguttatus* Gory, 4, 228; tab. 39, 219.
7. *A. zemes* Gory, 4, 234; tab. 39, 225. Unknown to me.
8. *A. fuscipennis* Gory, 4, 238; tab. 39, 230.
9. *A. frenatus* Gory, 4, 139; tab. 40, 231. Unknown to me.
10. *A. cupricollis* Gory, 4, 240; tab. 40, 232.
11. *A. aurolineatus* Gory, 4, 248; tab. 41, 240. *A. bilineatus* Say.
12. *A. subcinctus* Gory, 4, 252; tab. 42, 245.
13. *A. obsoletoguttatus* Gory, 4, 256; tab. 43, 249.
14. *A. nigricans* Gory, 4, 257; tab. 43, 250. Unknown to me.
15. *A. egenus* Gory, 4, 258; tab. 43, 251.
16. *A. virens* Gory, 4, 259; tab. 43, 252.

EUMERUS Lap. & Gory.

1. *Eu. ignarus* (Fabr.) L. & G. 2, 4; tab. 1, 5. *Buprestis cogitans* Weber.

CORÆBUS Lap. & Gory.

1. *C. caliginosus* L. & G. 2, 7; tab. 2, 9. Unknown to me.

ANTHAXIA Esch.

1. *A. viridicornis* (Say), L. & G. 2, 19, tab. 5, 25.
2. *A. quercata* (Fabr.) L. & G. 2, 21; tab. 5, 28.
3. *A. æneogaster* L. & G. 2, 32; tab. 7, 44. A California species, remarkable for its broad form.
4. *A. viridifrons* Gory, 4, 284; tab. 47, 277.
5. *A. cyanella* Gory, 4, 285; tab. 47, 278. *A. scoriacea* Mels.
6. *A. cuneiformis* Gory, 4, 290; tab. 48, 284.
7. *A. flavimana* Gory, 4, 291; tab. 49, 285.
8. *A. bivittata* Gory, 4, 292; tab. 49, 286. Unknown to me.

BRACHYS Solier.

1. *B. alboguttata* (Mann.) L. & G. 2, 2; tab. 1, 1. *Buprestis gracilis* Say; belongs to *Taphrocerus* Solier.
2. *B. tessellata* (Fabr.) L. & G. 2, 3; tab. 1, 2. ? *Bupr. ovata* Weber.
3. *B. terminans* (Fabr.) L. & G. 2, 3; tab. 1, 3.
4. *B. molesta* Gory, 4, 332; tab. 56, 325.
5. *B. æruginosa* Gory, 4, 335; tab. 56, 329.

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6. *B. americana* Gory, 4, 346; tab. 58, 343. *Metonius purpureus* Say. This and the next species belong to Solier's genus *Pachyscelis*, but the name given by Say has priority.

7. *B. punctata* Gory, 4, 347; tab. 59, 344. *Metonius ovatus* Say.

Descriptions of several new MAMMALS from Western Africa.

BY JOHN LECONTE.

Among a large collection of birds sent from Africa by M. du Chaillu, were a few species of Mammals, which have been referred to me for examination. The following is the result of my researches. Some of them appear to be new, at least I cannot find any thing like them described in any book in the possession of the Academy. I have hesitated about naming them, as some of them may be well known in Europe, but imperfectly described.

SEMNOPIHECUS ANTHRACINUS.

Entirely black, hair rather glossy, from two to three inches in length, over the eyes and on the top of the head coarse and bristly. Tragus broad. Thumb of the fore hands a mere oblong tubercle. Nails, except of the hind thumb, long and narrow. Tail very long, slightly tapering towards the point.

Length 2 feet 2 inches; tail 2 feet 7 inches; arms 1 foot 6 inches; legs 1 foot 9 inches. Seems to resemble the *Colobus satanas* of Waterhouse, Loud. Mag. for 1838, p. 335, which was brought from the Island of Fernando Po. The length of the hair in the specimen sent to England is stated by the very accurate naturalist who describes it to be ten inches, whereas in our animal it rarely in any part exceeds two.

CERCOPITHECUS BUCCALIS.

Above and on the sides, hair deep cinereous, annulate with rufous beneath, and on the inner parts of the thighs grey. Hair of the head black, annulate like that of the back. Cheeks with a large yellow spot which extends even behind the ear; behind the eye this spot appears to be bounded above by black. Arms and hands black, the hairs more or less tipped with rufous; beneath, except near the hands, they are grey. Tail for one-third of its length, above the color of the back, beneath grey; the rest of the tail is both above and beneath bright rufous, increasing in intensity to the end. Nails long, narrow and compressed. No callosities on the rump.

Length 1 foot 8 inches; tail 2 feet 5 inches; arms 8 inches; legs 1 foot 2 inches.

MICROCEBUS ELEGANTULUS.

Hair soft, dark cinereous, tipped with rufous brown, beneath with grey, the latter color extending somewhat towards the back from the axillæ and the groins, and on the forward edge of the legs and thighs; tail longer than the body, cylindrical, bushy, the hair tipped with grey, and at its root for about one inch in length with rufous. Nose rather pointed. Ears large, oblong, naked except at the base; lower fore teeth nearly horizontal; nails of the fore hands round with an acumination; nail of the hind thumb flat, of the first finger falciform and sharp; of the other fingers like those on the fore hands.

Length 8 inches; tail 12 inches; head 1 foot 9 inches; ears 1 inch.

VESPERTILIO PUSILLUS.

Black, body beneath a little mixed with gray. Head short and small. Upper fore teeth four, distant by pairs, simple; lower, six, trilobate; nose not emarginate. Ears small, oval, orillon lanceolate and rather blunt. Interfemoral membrane naked except at the base; tail projecting a little beyond the membrane.

Length 1.3 in.; ears .24; tail .8; naked part .05. Extent 6.9.

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SOREX ODORATUS.

Dark cinereous brown above inclining to chestnut, beneath slightly paler. Snout proboscidal, deeply emarginate at the point, and furrowed on the under side. Ears large, naked, with two rather large lobes within, the lower one of which appears to be the antitragus; tail long, triangular.

Length 5 inches; head 1.65; tail 2.6; ears .2.

This species has a very strong musky odor.

SCIURUS SUBVIRIDESCENS.

Above black, the hair tipped with pale brown, in some positions appearing greenish; beneath pale yellowish cinereous; tail longer than the body, of the same colors above and beneath, and tipped with black, not distichous. Head small. Ears rounded and very short, not tufted.

Length 6.7 in.; tail 7.5 in.; head 1.5 in.; ears .3.

SCIURUS LEMNISCATUS.

Above on the head, upper part of the back and legs rufous brown, mixed with darker and black. The back with four black stripes from the shoulders to the hinder parts of the body and two stripes of yellowish, with one of rufous (this last sometimes quite indistinct) down the middle of the back. Hair of the head annulate with black, of the sides dark cinereous tipped with pale rufous. Under side of the head, body and legs white. Head roundish; nose pointed; lower fore teeth slender; ears small round. Tail distichous.

Varies in having the paler stripes scarcely apparent.

Length 7.5 in.; tail 6.5 in.

SCIURUS RUFOBRACHIATUS.

Louis Fraser, Zoologia typica No. 24; Waterhouse, Proc. Zool. Soc. 1842, p. 128.

This animal is figured in Audubon and Bachman's Quadrupeds of North America, under the name of *Spermophilus annulatus*. The specimen described by Dr. Bachman was purchased in New York from a dealer in preserved birds. It is by no means a native of our continent.

SCIURUS PUMILIO.

Hair short and soft, dark cinereous, tipped with reddish brown, on the throat and belly with much paler. Head short roundish; ears small; tail shorter than the body, distichous; hair reddish brown at base and tip, black in the middle, appearing by this disposition of colors to be edged with brown; four of the toes on each foot equal.

Length 5.4; head .7. ear .2; tail 2.3; fore leg .9; hind leg 1.5.

ALUMINIUM.
The progress in its manufacture.

BY W. J. TAYLOR.

The use of sodium in the reduction of metals from their chlorides, as has been so successfully accomplished within the last two years, may be justly considered a great progressive step in science.

Aluminium has been the first in which this process has been perfected. What the other metals are which will be reduced successfully from their chlorides by the use of sodium, the future will determine. Some facts concerning the early history of aluminium, the progress made in its manufacture, and the numerous uses to which it can be applied, will not be uninteresting.

Much confusion existed in the minds of the early alchemists regarding the oxide alumina. They knew of an alum which was brought from the East, which they regarded for a long time as sulphuric acid combined with an earth. Stahl and others also mistook this earth for lime. Geoffroy, in 1728, pointed out its existence in clay; Marggraff, in 1754, proved it to be a substance having a sepa-
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rate existence and peculiar characters. To Oerstedt belongs the credit of first preparing the chloride of aluminium, from which compound Wöhler, in 1827, succeeded in first eliminating the metal. Wöhler first obtained aluminium in the form of a grey powder, by heating gradually in a porcelain crucible over a spirit lamp equal volumes of metallic potassium and chloride of aluminium; other chemists, by slight modifications of this process, have obtained aluminium in the form of the grey powder, as first obtained by Wöhler.

To M. Sainte Claire Deville belongs the credit for first improving the process, so as to produce aluminium in such quantities that its characters as a metal could be fully investigated. M. Ste. Claire Deville used in his process sodium as a substitute for potassium. (It requires 39 parts of potassium to produce the same reductive effect as 23 parts of sodium.) At the time of his first experiments sodium was worth one hundred dollars per pound; he so improved the process for making this metal as to reduce the price to ninety cents per pound.

At this time the chloride of aluminium was regarded with sodium as a curiosity of the laboratory; it was then produced in small quantities by heating alumina mixed with coal, in a porcelain tube, and passing over it a current of dry chlorine gas.

M. Ste. Claire Deville made farther improvements in this process, so as to make it in an apparatus as large as a gas retort and in quantities proportional, at a price of twenty-five cents per pound. To produce the reaction of sodium with the chloride of aluminium was the most difficult point of the entire process. M. Ste. Claire Deville used for the reduction the distillation of the chloride of aluminium over the sodium, which was placed in trays of copper enclosed in a tube. The temperature developed by the reaction is very great if the current of the chloride of aluminium be rapid; by this process it was found that it required at least ten pounds of sodium to produce one pound of aluminium, (part of the aluminium produced being destroyed at its formation by the scoræ,) when by theory it required only two and a half pounds. This great loss of sodium and the difficulties in conducting this reaction on a large scale, were very great objections to the process.

All the aluminium at the Paris Exhibition was made by this process, and it was from a portion of this that M. Regnault made his investigations, and in which he found copper and iron. The copper came from the trays in which the reduction was made. The presence of these metals in small quantities will account for the peculiar physical properties which he ascribed to aluminium.

Circumstances having interrupted M. Ste. Claire Deville in the experiments which he was making on a large scale, the subject rested for a while here. In the meanwhile Heinrich Rose suggested and made experiments with cryolite, (a fluoride of aluminium and sodium,) and gave his views that this mineral was a valuable substance from which to produce aluminium.

Wöhler made experiments also with cryolite, and arrived at conclusions somewhat similar to Heinrich Rose. They both succeeded in producing some of the metal, but the results were not entirely satisfactory.

M. Ste. Claire Deville again resumed his experiments, but instead of distilling the chloride of aluminium on the metallic sodium, as in his first experiments, he fused in a crucible, in the manner pursued by Rose and Wöhler, using, however, with the double chloride of aluminium and sodium and the metallic sodium, the fluoride of calcium, (fluor spar,) or some cryolite as a flux. This experiment of M. Deville was very satisfactory, and the reduction in accordance with the theory.

While these experiments were in progress in Europe, similar ones were being made in this country by Mr. Alfred Monnier, in Camden, N. J.; to him credit is due for having first made aluminium in the United States. Having had opportunities for examining his processes for making the double chloride of aluminium and sodium, metallic sodium, and the modes of reduction, melting and refining the aluminium, the conclusion is satisfactory that the discoveries of science have been successfully applied to render the manufacture of this metal an industrial art.

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Mr. Monnier in his experiments met with the same difficulties in the reduction. He found, however, by careful investigation and analysis, that the effect produced was also perfectly in accordance with the theory. When, after great difficulties, sufficient quantities of pure aluminium were obtained, and its properties as a metal carefully studied; it was found that it was not in the least degree oxidized by fusion with the nitrate of potash. This peculiar property causes a strong contrast between it and any well known metal, and this wonderful fact produced a new phase in the manufacture of aluminium. Owing to this discovery, the efforts which had been made to produce aluminium from perfectly pure material were found unnecessary.

By using pure materials for its manufacture, it was necessary to employ apparatus which was very costly, as it required that it should be free from any injurious substances.

By the facility with which aluminium can be refined, owing to its peculiar properties to resist oxidation, it can be manufactured from impure and crude materials, in apparatus which can be cheaply made of still cheaper material, and without the great care and watchfulness necessary in the manipulations, where pure materials are employed.

Since July, 1855, Mr. Monnier has made the double chloride by mixing alumina with salt (chloride of sodium) and coal, and by passing over this mass (ignited) a current of dry chlorine gas, (kaolin or common clay can be used instead of the alumina.) The double chloride runs out from the condenser in a stream, and is collected in a receiver; it becomes solid when cold.

The reaction is so complete that no chlorine is lost. It has already been manufactured at a cost of eight cents per pound, but the operations were carried on to a very limited extent. It is, however, clearly (to be) demonstrated that, with works of sufficient size and a proportional economy in manufacture, the double chloride of aluminium and sodium, can be produced at a cost not exceeding four and a half cents per pound.

In the manufacture of sodium Mr. Monnier has made considerable improvement; it has already been produced at a cost of twenty-five cents per pound.

In the manufacture of zinc (by the Belgian process) one retort produces about thirteen pounds of metal in 24 hours. In the manufacture of sodium the reduction is so quick that 52 pounds of this metal can be produced in a retort of the same size in the same space of time.

The reduction of zinc costs from two to two and a quarter cents per pound. The amount of ore necessary, being from a half to three-quarter cents per pound. Giving for the cost of one pound of metal about three to three and a quarter cents.

The reduction of sodium costs about	4 cents per pound.
The carbonate of soda, 2½ lbs. at 4 cents,	10 " "

Giving for total cost of one pound of sodium,	14 "
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Sodium can be manufactured on as large a scale as zinc, and when the workmen have the same practical experience in the manipulations, the price of reduction will be still farther reduced, so that the difference between it and zinc will be that of the first cost of carbonate of soda and the zinc ore.

It has already been shown that the double chloride of aluminium and sodium can be produced at a very low price; metallic sodium can also be made very cheaply; the reduction is readily effected in accordance with the theory, but the difficulty in uniting the metallic globules of aluminium when formed, is obviated by stirring at this point with a rod, and the destruction of the metal by the alkaline scoria is prevented by adding to the charge of the double chloride of aluminium and sodium, chloride of sodium and metallic sodium, either fluoride of calcium, (fluor spar,) or cryolite.

By these means the greater portion of the metal is united in one mass, the other portion of the metal in small globules remain with the slag, which can be removed mechanically, or by first digesting in water; there will however remain

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about ten per cent. with the slag. This will be explained by the following data. Theoretically:

	250 parts of metallic Sodium produce
100	" " Aluminium;
70	parts are obtained in one metallic mass;
20	" " in metallic globules;
90	" being the nett produce.
10	" remain with the scoria.
Total,	100

The alkaline scoria contains large quantities of the chloride of sodium, that can be easily extracted by water, leaving an insoluble residue from which the fluoride of aluminium can be extracted by volatilization. The scoria containing the fluoride and the metallic aluminium is economically used by introducing it again with a new charge of the double chloride of aluminium and sodium, and metallic sodium, and by that means the loss of the metal is rendered very small.

Aluminium, when carefully removed from any slag, is readily fused in a crucible by itself; when in fusion (which is at a lower point than that required to fuse silver) the whole is stirred with a rod, and all the globules of metal are united in one mass with the greatest facility; at this point nitrate of potash can be added, (the stirring continued.)

All other metals are oxidized by this process; the refining is finished when the metal has a pure white color. It can now be poured into a mould of any shape.

Impure aluminium may be whitened by plunging it into caustic potash or soda, washing it quickly with distilled water, plunging it again into pure nitric acid, again washing quickly and thoroughly. The surface then has the fine white color of pure aluminium, which it retains unless afterwards polished. This operation has for its object to dissolve out the metals which darken the color of aluminium by their presence.

Aluminium forms alloys with nearly all the metals, but those which it forms with silver and copper are the most interesting.

Five parts of aluminium with one hundred parts of pure silver produce an alloy almost as hard as a silver coin, which contains about one-tenth of copper, so that sufficient hardness can be given to silver, without introducing into it a poisonous or an alterable metal. It has the advantage of being worked like silver in a pure state, possessing, however, greater hardness, and being capable of a higher polish.

Ten parts of aluminium and ninety parts of copper produce an alloy of a pale gold color, possessing great hardness and considerable malleability; its hardness is greater than that of bronze, in the proportion of fifty-one to forty-nine. It can be worked when warm, with the same facility as the best soft iron.

Twenty parts of aluminium and eighty of copper give to the alloy the color and brilliancy of fine gold, and at the same time sufficient hardness to scratch the alloy of gold employed in coin, without impairing in the slightest degree its malleability.

By an increase of the per centage of copper in alloys of aluminium the alloy is rendered brittle, showing that the metal must be either used pure or alloyed in small quantities with the copper.

This explains the peculiar properties ascribed to it by M. Regnault in his investigations on the physical properties of the aluminium prepared by M. Deville, exhibited at the Paris exhibition.

Numerous experiments have been made (without regard to economy of manufacture) to obtain the aluminium directly from the oxide alumina, or from the fluoride of aluminium.

But the results obtained by the use of this double chloride of aluminium and

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sodium, have fully demonstrated that it is the most economical mode by which to produce this metal. Theoretically it requires—

3.86 Chlorine, at 6 cents per pound,		23 16-100
1.86 Alumina, at 3 " "		05 58-100
5.68 Carbonate of Soda, at 4 cents per pound,		22 72-100

Total,		51 46-100
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Making for the materials for manufacturing one pound of aluminium, estimated at the market prices, 51½ cents. Practically it requires—

16 lbs. of the double chloride of aluminium and sodium, at 8 cts. per lb.,	\$1 28
2½ lbs. metallic sodium, at about 25 cents per lb.,	70
Flux and cost of reduction,	2 02

Total,		\$4 00
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By manufacturing on a larger scale, and by using the slag as a flux instead of employing fresh material, the lowest cost will be reduced to the following:

10 lbs. of double chloride of aluminium and sodium, at 4½ cents per lb.,	\$0 45
2½ lbs. of sodium, at 14 cents per lb.,	35
Cost of reduction,	20

Total,		\$1 00
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It is seen that the actual cost of one pound of aluminium, when manufactured extensively, will be about double the theoretical cost as before estimated, (fifty-one cents.)

For the production of aluminium are used clay, salt, sulphur, manganese, lime and fluor spar, materials which are very abundant and cheap; all that is now required is practical experience, to reduce the price of the metal still nearer to the price of the raw materials, as has been before stated. The history of the useful arts contains numerous instances that, where skill and perfection of apparatus are required, difficulties are speedily overcome.

The density of aluminium when moulded is 2.56. The density of aluminium when rolled is 2.67. In equal weight with silver it is four times more voluminous. In equal weights with copper, bronze, brass and German silver, it possesses from three to three and a half times greater volume. In equal volumes with the above metals and alloys it possesses greater rigidity.

Mention has already been made of a very important property of aluminium when pure; that is to resist oxidation, a property which it possesses to a greater degree than the other metals.

Aluminium is not acted upon by nitric acid, hydrosulphuric acid, or by the organic acids; slightly by sulphuric acid. It is but little affected by fusion with sulphur; mustard is found to act upon it slightly. Its true solvent is hydrochloric acid.

When we compare it in these respects with those metals, which are acted upon by most of these acids giving salts, which are more or less poisonous, the comparison is favorable to aluminium, as its salts, if formed, are innocuous.

According to M. C. Tissier, aluminium is not changed by a solution of nitrate or sulphate of copper, but it is dissolved by a solution of chloride of copper with the separation of metallic copper. It is attacked, however, by a solution of nitrate or sulphate of copper when it contains chloride of sodium, and this proves that chloride of copper is formed by the presence of the chloride of sodium. Aluminium is not attacked by an aqueous solution of alum, or by one of chloride of sodium, but a mixture of the two dissolves it with an evolution of hydrogen, and this proves that chloride of aluminium is contained in the mixture.

Wheatstone long since showed that aluminium was as strongly electro-negative as platinum. Its sonorous qualities are very great, like that of crystal. Various are the uses which can be made of the aluminium and of its alloys with silver and copper. All the purposes for which it could be advantageously employed in virtue of its peculiar properties, of not tarnishing by exposure to atmospheric agencies, and its lightness combined with its extraordinary strength, 1857.]

would be far too tedious to enumerate. A few instances only will suffice of its adaptability for philosophical apparatus, for all articles for table, for service and ornament, for kitchen utensils, for the works of clocks and even watches, for trappings of harness, for plate and door knobs, keys, &c. Its sonorous qualities render it valuable for making bells. In the galvano-plastic arts it replaces platinum.

Aluminium is most easily soldered with its own alloys. The alloys most convenient are those with silver, zinc or tin, their point of fusion being below that of aluminium. The soldering may be done by means of a spirit lamp, and without any previous cleaning.

Pure aluminium can be easily distinguished from impure by its greater whiteness, its indistinct traces of crystallization; occasionally one or two well-defined hexagons can be recognized on the surface of the ingots. The impure has a bluish tint like zinc, and if the entire surface is not crystalline, the upper surface is always more so than in pure aluminium; the form of the crystals is also quite different.

In giving the theoretical proportion of material employed in the manufacture of aluminium, the relative cheapness of its production, its properties and strength when comparing it bulk for bulk with other metals, it is desired to demonstrate its valuable properties and uses, also to guard against the fictitious reports so current of its excessive cheapness.

NOTE.—The experiment of Sir H. Davy should be mentioned in the early production of this metal; he endeavored to produce it by passing the vapor of potassium over alumina at a white heat; he obtained only small grey particles interspersed with aluminate of potash.

[Jan.

NATURAL SCIENCES OF PHILADELPHIA.

February 3d.

Vice-President BRIDGES in the Chair.

A letter was read from Rev. E. J. Lowe, dated Observatory, Beeston, near Nottingham, (England,) Jan. 7th, 1857, containing the following passage :—

"The late Mr. Lawson, F. R. S., left me his valuable collection of Meteorological Instruments, amongst which are Dr. Benjamin Franklin's Hygrometer, which is in as good working order as on the day it was made, an Electric Kite belonging to Dr. Franklin, and several letters. Mr. Lawson had a card placed on the hygrometer, with the following inscription, 'Invented by and belonged to Dr. Benjamin Franklin, the Patriot of Philadelphia.' I have mentioned this, thinking that you would feel an interest as American Philosophers in the information respecting the instruments of that glorious philosopher Dr. Franklin."

Communications were presented for publication in the Proceedings entitled :—

1. Descriptions of American land shells. By W. G. Binney.
2. Prodrômus descriptionis Animalium evertibratorum, quæ in expeditione ad Oceanum Pacificum Septentrionalem a Republica Federata missa, Joh. Rodgers duce, observ. et descriptis W. Stimpson.
3. On the Crania of the Ancient Britons, with remarks on the people themselves. By Joseph Barnard Davis.

Which were severally referred to Committees.

Mr. Lea made the following remarks on the visual organs of certain species of the genus *Unio* :

He stated that he had at various times paid a good deal of attention to the habits and organs of the *NAIADS* of our own country, and for that purpose frequently had them for long periods in a living state under his observation. Their condition as to special sense has been of great interest, and particularly those of *touch*, *hearing* and *sight*. In the course of these investigations, it became evident to him that some species of *Unio* were *sensitive to light*, and he found one species (*Unio radiatus*) very eminently so. He stated that he was not aware of its ever having been suggested that any of the family were possessed of organs of sight, even in a young state, as in the case of the young of *Mytilus edulis*. It is well known that some of the Molluscs have large and perfect eyes, while some others have imperfect ones, but generally they are altogether devoid of the optic nerve. The *Strombidae* are said to possess an eye highly organised, but in most of the *Gasteropoda* it is of a more simple structure, and perhaps only possesses sensibility of light without the power of distinct vision. The terrestrial *Gasteropoda* have usually a distinct eyeball on the extremity of the superior tentacula, which Dr. Leidy has shown, in some of our species of *Helices*, to possess a crystalline lens and choroidea, with clear, consistent, vitreous humor. Cuvier and Lamarck considered the whole class of *Conchifera* to be devoid of eyes, but Poli has shown that in *Pecten varius*, Lin., the margin of the mantle is furnished with numerous eyes. These, according to Carpenter, are protected by a sclerotic coat with a transparent cornea in front, a layer of pigment, a crystalline lens and vitreous body, and a retinal expansion proceeding from an optic nerve. In the course of his observations, Mr. Lea became satisfied that the closing of the siphonal tubes, on his approach to the specimens he had in his vivarium, was not altogether occasioned by the vibration caused by his approach, and he accordingly arranged numerous individuals of several species with a view carefully to observe them. In the course of these examinations repeatedly made, he found several species of *Unio* quite sensitive to his passing his hand between them and the light, while the *Margaritana margaritifera*, and 1857.]

Anodonta undulata and *A. lacustris*, Lea, showed no signs of sensitiveness. *Unio inflatus* exhibited but little motion, while numerous specimens of *U. radiatus* invariably gave more or less sign when the interruption of light took place. Some individuals were more sensitive than others, and the females exhibited this power much more than the males, often withdrawing, not only their siphons, but their mantle within the valves.

It is difficult to say with certainty how far their visual organs are developed, as well also as to number and exact position. The fringes of the branchial and anal siphons are, in the *Uniones*, formed of small, subconical tentacula. These are larger in the branchial siphon of *Unio*, while they do not exist at all in the anal opening of *Anodonta*. With a good lens the terminal point of the tentacula may be observed to be rounded and furnished with at least the appearance of an eye, and that it will prove to be a true eye, however imperfect, there can be but little doubt. Mr. Lea did not intend to pursue the minute anatomy of this organ; he left it to Dr. Leidy, who had done so much in the histology of the terrestrial Gasteropods, believing that he would be able to make out the complete anatomy of the eye in the *Unio*.

February 17th.

Vice-President LEA in the Chair.

Communications for publication in the Proceedings were read, entitled:—

1. Notice of a collection of Reptiles made by Dr. Henry A. Ford in the Gaboon country, West Africa, by Edward Hallowell, M. D.

2. Description of thirteen new species of UNIONES from Georgia, by Isaac Lea.

Which were referred as usual to Committees.

Dr. Leidy made the following observations on entozoa found in the Naiades.

He had observed a curious parasite allied to *Aspidogaster conchicola*, infesting *Anodonta fluviatilis* and *Anodonta lacustris*, within the cleft of the upper branchial cavity, adhering to the outer surface of the renal organ and the contiguous margin of the foot. The new parasite, for which the name of *Cotylaspis insignis* was proposed, is from $\frac{1}{4}$ a line to 1 line long, curved funnel shaped, with the base forming an oval ventral disk provided with an outer circle and an inner row of acetabula 29 in number. The animal is provided with distinct eyes, while *Aspidogaster*, in accordance with its being imprisoned in the pericardium of the Naiades, is blind.

February 24th.

Vice-President BRIDGES in the Chair.

The following communications, on report of the Committees to which they had been referred, were ordered to be published in the Proceedings.

Descriptions of American L and Shells.

BY W. G. BINNEY.

HELIx INTERIORA. Testa solidissima, luteo-cinerea, apice rufa, globoso-conica; spira brevis, sutura impressa; anfr. quinque convexiusculi, lineis parallelis, valvibus, valde demissis, striae incrementales distinctas interdentibus; anfractus [Feb.

altissimus globosus, supra perpheriam fasciâ unicâ, rufâ, obscurissimâ ornatus; apertura maximè obliqua, formâ equicalcei, rotundata; labrum albo-cinereum, incrassatum, subtus reflexiusculum, subunidentatum, umbilicum occultans; marginibus approximatis, callo interjunctis. Diam. maj. 22; min. 19; alt. 15 mill.

Habitat in provinciâ Oregon.

Figurata est sub nomine *H. Nickliniana*, Lea, var. tabula vi. patris mihi Amos Binney, Doctoris, (Terrestrial Mollusks, iii. t. vi. fig. 1, icon in medio posita, vol. ii. p. 120). Sed differt ab hac specie et ab *H. Californiense*, Lea, formâ testâ solidiori, aperturâ, et sculpturâ indentatâ et granulatâ absentia. Ab aliis Californiæ et Oregon speciebus hodie cognitâ, lineis profundis volventibus facile noscitur.

SUCCINEA LINNATA. Testâ oblongo-ovatâ solidiori, albidâ, vel cinereâ; spirâ elevatâ, acutâ suturâ impressâ, anfr. ternis convexis, lineis crassis parallelis inter rugas incrementales volventibus ornatâ; aperturâ oviformis, partem testæ dimidiam æquante; columellâ plicatâ, pariete callo albo indutâ. Diam. 6, alt. 12 mill.

In provinciâ Nebraska, ad flumen 'Yellowstone' prope Fort Union specimina plurima collegit Dr. F. V. Hayden.

Similis *S. vermetæ*, Say, sed formâ magis ovali, aperturâ anfractibus convexis et spira breviori differt. Cognoscitur inter Succineas Americanas testâ solidiori, aperturâ oviformi, et specialiter lineis volventibus in anfr. ultimo positâ.

Prodromus descriptionis animalium evertebratorum quæ in Expeditione ad Oceanum, Pacificum Septentrionalem a Republica Federata missa, Johanne Rodgers Duce, observavit et descripsit

W. STIMPSON.*

PARS I. TURBELLARIA DENDROCELA.

CONSPICUUS GENERUM ET FAMILIARUM.

Species nonnullas dubias vel non plene descriptas quarum exemplis non occurri, non tentatum est hic generatim distribuere. Index omnium tamen in cl. DISSINGEN Systemate Helminthum inveniatur, cui refertur lector.

Monocelis auctoritate SCHULTZII, (Beiträge zur Nat. der Turbellarien,) locum suum habet in *Rhabdocelorum* tribu. *Telostoma* Oerst., *Distigma* Hemp. et Ehrenb., et *Tetracelis* Hemp. et Ehrenb., mihi videtur eidem tribui pertinent. *Niobe* generis Girardii, (Bost. Proc. Nat. Hist., iv. 210.) Gasteropodum est generis *Limapontice*. *Planaria bilobata* Leuck., *Centrostromum incinum* Diesing, et *Diplanaria notabilis* Darwin, forsitan Planariæ in re esse bipartiendi sunt.

Cum DISSINGIO nomen *Dendrocela* totæ tribui applico. Divisiones ejusdem vero *Ceridea* et *Aceridea*, formas affines, e. g., *Stylochus* et *Leptoplana* separant; et genera admodum diversa, e. g., *Euryleptia* et *Planaria*, approximant. Sic ea secundum aperturarum genitalium numerum divisi.†

Subtribus I. *DIGONOPORA*. Aperturæ genitales duæ.

EURYLEPTIDÆ.

Corpus planum, dilatatum, læve v. papillosum. Caput plicis tentacularibus (pseudotentaculis, *Quatref.*) duabus frontalibus. Os ante medium situm. Ocelli numerosi prope extremitatem anteriorem siti. Maricolæ.

THYSANOTHOON, Grube. (Actin. Echinod. u. Würmer d. Mittelmeeres, 54. 1846) —

* Communicated by the Smithsonian Institution.

† Dr. Carolus Girard figurarum ineditarum suorum generum et specierum novarum mihi benigne usum dedit, quibus eorum characteres et affinitates designare possum.

1867.]

Corpus supra papillis ubique obsessum. Caput discretum, tentaculis mediocribus. Ocelli frontales aut cervicales. Os subcentrale. Apertura genitalis mascula subcentralis, femina retrorsum sita.

T. Diesingii, Grube, l. c., 54; Archiv für Naturgeschichte, xxi. 2, 143.

T. Brocchi, Oerst. *Eolidiceros Brocchi*, Quat.; Voy. en Sicile, ii. 40, pl. 5, f. 1. (vix Th. B., Grube, Arch. f. Naturg. xxi. 2, t. 6, f. 4, 5.)

T. Dicquemaris, Oerst.; Entwurf einer Syst. Einth. etc. der Plattwürmer, 47.

T. Fockei, Diesing, Syst. Helminthum, i. 213.

T. nigrum, Girard, Proc. Bost. Soc. Nat. Hist. iv. 137.

T. australe, infra.

PLANEBOLIS, n. g. Corpus papillis sparsis, seriebus duabus lateralibus dispositis. Caput grande, discretum, tentaculis magnis. Ocelli capitales et tentaculares. Os subcentrale.

P. Panormus. *Eolidiceros Panormus* Quatref., Voy. en Sicile, ii. 42, pl. 3, fig. 2.

PROCEBROS, Quatref. (Voy. en Sicile, ii. 37. 1845.) Corpus læve. Caput subdiscretum, tentaculis subdistantibus. Ocelli cervicales v. tentaculares. Os subterminale. Aperturæ genitales retrorsum sitæ.

P. argus, Quatref.; l. c. ii. 37, pl. 3, f. 5.

P. sanguinolentus, Quatref.; l. c. ii. 38, pl. 4, f. 4.

P. albicornis, infra.

EURYLEPTA, Hemp. et Ehrenb. (Symb. phys., Phyt. Turb., N. 11. 1830.) Corpus læve, tenue. Caput vix subdiscretum. Plicæ tentaculares marginales approximatae. Ocelli in acervum minutum cervicalem. Os ab apice circiter quartam corporis partem remotum. Apertura genitalis mascula ante, feminea pone os sita (an semper?).

E. prætexta, Hemp. et Ehrenb., l. c., N. 11, 1.

E. flavomarginata, Hemp. et Ehrenb., l. c., N. 11, 2.

E. cornuta, Hemp. et Ehrenb., l. c., N. 11. *Planaria cornuta*, Müll.

E. zebra, Diesing, Syst. Helminthum, i. 211. *Planaria zebra*, Leuckart, in Ruppell's Atlas, T. iii. f. 1, a, b.

E. limbata, Diesing, l. c. i. 210. *Planaria limbata*, Leuckart, l. c., T. iii. fig. 4.

E. velutina, Diesing, l. c., i. 210. *Proceros velutinus*, Blanchard, Voy. en Sicile, iii. pl. viii. fig. 2, a, b.

E. fulminata, niger, interrupta, guttato-marginata, Japonica, et coccinea, infra.

NAUTILOPLANIDÆ.

Corpus planum, hyalinum. Caput parvum, discretum, auriculis duabus. Ocelli nulli. Os post-mediale, œsophago protractili multilobo. Aperturæ genitales antrorsum sitæ. Pelagicæ.

NAUTILOPLANA, genus (novum) unicum.

N. oceanica. *Planaria oceanica*, Darwin, An. et Mag. Nat. Hist., 1st ser. xiv. 246. *Eurylepta oceanica* Diesing, l. c., i. 211.

CEPHALOLEPTIDÆ.

Corpus planum dilatatum. Caput discretum, extremitate acetabuliformi. Ocelli duo. Os subcentrale, œsophago valde protractili. Aperturæ genitales ante os sitæ. Aquarum subsalarum incolæ.

CEPHALOLEPTA, Diesing, (Syst. Helminthum, i. 189, 1850) genus unicum.

C. macrostoma, Diesing, l. c., i. 189. *Planaria macrostoma*, Darwin, l. c., xiv. 247, pl. v. fig. 2.

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TYPHLOLEPTIDÆ.

Corpus planum v. depressum, capite continuo, tentaculis nullis. Ocelli nulli. Os subcentrale ante v. post medium situm. Aperturæ genitales retrorsum sitæ (an semper?). Maricolæ.

TYPHLOLEPTA, Oerst., (Entwurf einer Syst. Einth. etc. der Plattwürmer, 50. 1844.) Corpus plano-depressum, oblongum, dilatatum. Os pone medium situm. "Penis absque stylo calcareo."

T. cæca, Oerst., l. c., 50.

T. ? rubrocincta. *Orthostomum rubrocinctum*, Grube; Actin. Echinod. u. Würmer d. Mittelmeeres, 56. Arch. für Naturg. xxi. T. 6, f. 6.

T. extensa, LeConte; Proc. Acad. Nat. Sci. Philad., v. 319.

CRYPTOCÆLUM, n. g. Corpus planum, crassiusculum, latum, utrinque rotundatum. Os ante medium situm. Parasiticæ.

C. opacum, infra.

TYPHLOCOLAX, n. g. Corpus oblongum, depressum, utrinque attenuatum. Os post medium situm. Parasiticæ.

T. acutus. *Typlolepta acuta*, Girard, in Stimpson's Marine Invert. of Grand Manan, 27.

T. ? marinus. *Typhloplana marina*, Oerst., l. c., 27, f. 31.

T. acuminatus, infra.

LEPTOPLANIDÆ.

Corpus planum, dilatatum, læve, sæpius tenerrimum. Caput continuum, tentaculis nullis. Ocelli plus minusve numerosi, occipitales v. occipitales et marginales. Os ante medium situm. Aperturæ genitales pone os, sæpius pone medium situm. Maricolæ.

CENTROSTOMUM, Diesing. (Syst. Helm. i. 199. 1850.) Ocelli in acervos duos parallelos dispositi. Os centrale, œsophago protractili multilobo. Aperturæ genitales retrorsum sitæ.

C. lichenoides, Diesing, l. c., i. 199, *Planaria lichenoides*, Mertens.

ELASMODES, LeConte. (Proc. Acad. Nat. Sci. Philad., v. 319, 1851.) Corpus oblongum, tenerrimum. Ocelli occipitales in acervos duos sæpius lineares et parallelos dispositi. Os ante medium situm. Apertura genitalis mascula centralis, feminea retrorsum sita.

E. flexilis. *Planaria flexilis*, Dalyell. Gosse, Brit. Mar. Zool., i. f. 126.

E. pallidus. *Polycelis pallida*, Quatref. Voy. en Sicile, ii. 33, pl. iii. f. 8.

E. modestus. *Polycelis modesta*, Quatref. l. c. ii. 33; pl. iii. f. 11.

E. tigrinus. *Polycelis tigrina*, Blanch., Voy. en Sicile, iii. f. 74.

E. (?) gracilis. *Prosthlostomum gracile*, Girard, Proc. Bost. Soc. Nat. Hist., iii. 251.

E. discus, LeConte, l. c., v. 319.

E. acutus et tenellus, infra.

LEPTOPLANA, Hemp. et Ehrenb. (Symb. Phys. Phyt. Turb., N. 12. 1830.) Corpus planum, dilatatum, tenerrimum. Ocelli omnes occipitales, formarum duarum; *primarii* majores, angulares, nigri, conferti, in acervos duos sæpius lineares in umbonibus aggregati; *secundarii* minuti in acervos nebuliformes dispositi. Os subcentrale, ante medium. Aperturæ genitales retrorsum sitæ.

L. hyalina, Hemp. et Ehrenb., l. c. N. 12, 1, T. v. f. 6.

L. tremellaria, Oerst. viz Gosse in Brit. Mar. Zool. 1, f. 125.

L. atomata, Oerst. l. c., 49.

L. fallax, Diesing. *Polycelis fallax*, Quatref. Voy. en Sicile, ii. 35, pl. 3, f. 10.

L. lævigata, Diesing. *Polycelis lævigata*, Quatref., l. c., ii. 34, pl. 4, f. 2.

L. ellipsoides, Girard, in Stimpson's Mar. Invert. of Grand Manan, 27, fig. 16.

1857.]

L. humilis, oblonga, delicatula, maculosa, patellarum, punctata, Schönbornii, trullæformis, et fusca, infra.

Dromus, Stimpson. (Proc. Acad. Nat. Sci. Philad., vii. 389, 1855.) Corpus planum, dilatatum. Ocelli in umbones duos subdistantes, occipitales, dispositi. Ocelli marginales nulli. Os subcentrale.

D. badius, St., l. c. vii. 389.

D. oblongus, St., l. c. vii. 389.

PAUCHYPLANA, n. g. Corpus latum, crassiusculum. Ocelli primarii in umbones duos parvos occipitales aggregati; secundarii in margine anteriore dispositi. Os subcentrale.

P. lactea, infra.

PROSTHIOSTOMUM, Quatref. (Voy. en Sicile, ii. 35. 1845.) Corpus oblongum. Ocelli numerosi, quidam in acervum unicum sæpe bipartitum occipitalem, reliqui anteriores, marginales aut submarginales, arcuatim dispositi. Aperturæ genitales subcentrales.

P. arctum, Quatref., l. c., ii. 36.

P. elongatum, Quatref., l. c., ii. 36, pl. 3; f. 12.

P. affine, tenebrosus, constipatum, cribrarium, crassiusculum, sparsum, grande, collare, et obscurum, infra.

DIPLONCHUS, n. g. Corpus oblongum, crassiusculum et maculatum ut in *Stylochia*. Caput papilla occipitali, bilobata ocellifera instructa. Ocelli numerosi, minuti, ad papillam, etiam sæpe ad ejus basim dispositi. Ocelli marginales nulli.

D. marmoratus, infra.

STYLOCHIDÆ.

Corpus planum sæpius crassiusculum. Tentacula duo parva, brevia, occipitalia. Ocelli numerosi ad tentacula, vel in acervos capitales aggregati. Os subcentrale. Aperturæ genitales approximatae, retrorsum sitæ. Maricolæ.

STYLOCHUS, Hemp. et Ehrenb. (Symbolæ Physicæ, Phyt. Turb. N. 8. 1839.) Corpus læve. Tentacula subdistantia. Ocelli numerosi, minuti, conferti in tentaculorum superficie; marginales nulli.

S. Suesensis, Hemp. et Ehrenb., l. c. N. 8, t. v. f. 3.

S. corniculatus et obscurus, infra.

STYLOCHOPLANA, n. g. Corpus læve. Tentacula subapproximata. Ocelli ad basim tentaculorum v. in acervos vicinos aggregati; marginales nulli.

S. folium. *Stylochus folium*, Grube, l. c., 51, f. 12.

S. maculata. *Stylochus maculatus*, Quatrefages, Voy. en Sicile, ii. 44, pl. 4, fig. 3.

S. reticulata et tenuis, infra.

CALLIOPLANA, n. g. Corpus tenue, læve. Tentacula elongato-conica, gracilia, approximata in areola alba. Ocelli ad tentacula et in areola inter tentacula; marginales nulli.

C. marginata, infra.

TRACHYPLANA, n. g. Corpus crassiusculum, supra tuberculatum. Tentacula parva, inconspicua, hyalina. Ocelli ad tentacula; marginales nulli.

T. tuberculosa, infra.

STYLOCHOPSIS, n. g. Corpus subcrassum, molle. Tentacula distantia, obtusa. Ocelli magni ad tentacula, et minuti ad marginem anteriorem; interdum quoque in acervum occipitalem.

S. limosus, et conglomeratus, infra.

IMOGINE, Girard. (Proc. Acad. Nat. Sci. Philad., vi. 367. 1853.) Corpus læve. Tentacula brevia. Ocelli duo magni, ad apicem tentaculorum; et numerosi, minuti in corporis margine.

I. oculifera, Girard, l. c.

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PLANOCERIDÆ.

Corpus planum, latum, læve. Tentacula duo elongata, subfiliformia, retractilia. Ocelli nulli. Os subcentrale. Aperturæ genitales retrorsum sitæ. Maricola.

PLANOCERA, Blainv. (Dict. d. Sci. Nat., lvii. 579), genus unicum.

P. Gaimardii, Blainv., l. c.

P. elliptica, Girard, Proc. Bost. Soc. Nat. Hist., iii. 251.

Subtribus II. *MONOGONOPOREA*. Apertura genitales unica.

PLANARIADÆ.

Corpus oblongum depressum v. subplanum, antice auriculatum v. subauriculatum, capite raro tentaculato. Ocelli duo globulis vitreis instructi; rarissime plures vel nulli. Os post medium situm, interdum centrale. Stomachus amplius, post medialis. Apertura genitales pone os. Aquarum dulcium v. marinarum incolæ.

PROOCOTYLA Leidy, m. s. *Corpus elongatum, antice vix auriculatum. Caput absque tentaculis. Frons disco evertibili acetabuliformi prædita. Ocelli duo distantes. Tubus cibarius varius parum divisus. Fluviatiles.*

P. fluviatilis, Leidy, m. s. *Dendrocoelum superbum*, Leidy, Proc. Acad. Nat. Sci. Philad., v. 288, (non Girard.)

GALROCEPHALA, n. g. *Corpus oblongum, antice subauriculatum. Caput bitentaculatum; tentaculis ab auriculis distinctis. Ocelli duo subdistantes. Os postmediale. Tubus cibarius ramis arbusculiformibus. Fluviatiles.*

G. superba. Dendrocoelum superbum, Girard, Proc. Bost. Soc. Nat. Hist., iii. 265. Nordam. Monatsb., ii. 2.

G (?) tentaculata. Fasciola tentaculata, Müll., Hist. Vermium, i. 2, 63.

DENDROCELUM, Oerst., (Entwurf einer Syst. d. Plattwürmer, 51. 1844.) *Corpus antice auriculatum, auriculis tentaculiformibus. Caput antice excavata v. bilabiata, absque tentaculis. Ocelli duo. Os subcentrale, œsophago protractili cylindrico. Tubus cibarius ramis arbusculiformibus. Fluviatiles.*

D. lacteum, Oerst., l. c. *Planaria lactea*, Auct.

D. fuscum. Fasciola fusca, Pallas.

D. vitta. Planaria vitta, Dugès, An. des Sci. Nat., 1st ser., xxi. 82.

PLANARIA, Müll. (*Dugesia*, Girard, Proc. Bost. Soc. Nat. Hist., iii. 265, 1850. *Corpus depressum, oblongum, capite sessius subdiscreto, triangulari, nec labiis nec acetabulo prædita. Ocelli duo subapproximati. Os subcentrale, œsophago protractili cylindrico. Fluviatiles.*

P. torva, Müll., etc.

P. gonocephala, Dugès, Ann. des Sci. Nat. 1st ser. xxi. 83, pl. ii. f. 22.

P. fusca, Dugès (non Gmel.) l. c. xv. 143, pl. 4, f. 4.

P. maculata, Leidy, Proc. Acad. Nat. Sci. Philad. iii. 251 et v. 289. *Dugesia maculata*, Girard, Nordam. Monatsb. ii. 3.

P. gonocephaloïdes. Dugesia gonocephaloïdes, Girard, Proc. Bost. Soc. Nat. Hist. iii. 265. Nordam. Monatsb. ii. 2.

P. Foremanii. Dugesia Foremanii, Girard, Proc. Bost. Soc. Nat. Hist. iv. 211.

P. truncata, Leidy, l. c. v. 225.

P. Sinensis, badia, et cinerea infra.

PHAGOCATA, Leidy. (Proc. Acad. Nat. Sci. Philad. iii. 248. 1847.) *Corpus antice subauriculatum, tentaculis nullis. Ocelli duo. Os post medium situm, œsophago protractili multipartito. Fluviatiles.*

P. gracilis, Leidy, l. c. Girard, Nordam. Monatsb. ii. 1. *Planaria gracilis*, Eald. Suppl. to No. 1, Monogr. of Limniades.

PROCHRODES, Girard. (Proc. Bost. Soc. Nat. Hist. iii. 251, 1850.) *Corpus depressum, antice truncatum, tentaculis auricularibus duobus. Ocelli duo distantes. "Tubi cibarii rami indivisi." Maricolæ.*

1857.]

P. ulvæ. *Planaria ulvæ*, Oerst. l. c. 53, T. 1, f. 5.

P. Wheatlandii, Girard. Proc. Bost. Soc. Nat. Hist. iii. 251. Nordam. Monatsb. ii. 4.

P. frequens. *Planaria frequens*, Leidy. Jour. Acad. Nat. Sci. Philad. 2nd ser. vol. iii. part 2, 143.

Fovla, Girard. (Proc. Bost. Soc. Nat. Hist. iv. 211, 1852.) Corpus depressum antice subtruncatum; fronte sæpius in medio producta v. acuta. Ocelli duo subapproximati. Tubus cibarius ramis indivisis. Maricolæ.

F. littoralis. *Planaria littoralis*, Oerst. l. c. pl. i. f. 6.

F. affinis. *Planaria affinis*, Oerst. l. c. 54.

F. Warrenii, Girard, Proc. Bost. Soc. Nat. Hist. iv. 211. *Vortex Warrenii*, Girard, l. c. iii. 264. Nordam. Monatsb. ii. 4.

F. graciliceps et *trilobata*, infra.

BDELLOURA, Leidy. (Proc. Acad. Nat. Sci. Philad. v. 242, 1851.) Corpus depressum, antice acutum v. subacutum, cauda subdiscreta dilatata. Ocelli duo. Os centrale, oesophago cylindrico. Stomachus latus. Cæca indivisa. Apertura genitalis——? Maricolæ.

B. longiceps, Leidy, Proc. Acad. Nat. Sci. Philad. v. 289. *Planaria longiceps*, Dugès, Ann. des Sci. Nat. 1st ser. xxi. 83, pl. ii. f. 21.

B. parasitica, Leidy, l. c. v. 242. ?*Vortex candida*, Girard, Proc. Bost. Soc. Nat. Hist. iii. 264.

B. rustica, Leidy, l. c. v. 243.

ASOCELIS, n. g. Corpus depressum, elongato-ovale, sæpe antice truncatum. Os post medium subcentrale. Ocelli nulli. Fluvitiles.

A. cæca. *Planaria cæca*, Dugès. Ann. des Sci. Nat., 1st ser. xxi. 83, pl. ii. f. 20.

A. fuliginosa. *Planaria fuliginosa*, Leidy, l. c., v. 225.

OLIGOCELIS, n. g. Corpus oblongum depressum, antice auriculatum. Ocelli sex in acervos duos parallelos subterminales dispositi. Os post medium subcentrale. Tubus cibarius ramis arbusculiformibus. Fluvitiles.

O. pulcherrima. *Dendrocelum pulcherrimum*, Girard. Proc. B. S. N. H. iii. 265. Nordam. Monatsb. ii. 2.

POLYCELIDÆ.

Corpus oblongum, planum, dilatatum. Ocelli numerosi marginales. Os post medium subcentrale, oesophago cylindrico, longe protractili. Apertura genitalis retrorsum sita. Fluvitiles.

POLYCELIS, Hemp. et Ehrenb. (Symbolæ Physicæ, Phytæ. Turbell. No. 7. 1830) genus unicum.

P. nigra, Hemp. et Ehrenb. *Planaria nigra*, Müll., J. Johnston, Dugès, etc.

P. brunnea. *Planaria brunnea*, Müll.

P. Viganensis. *Planaria Viganensis*, Dugès, Ann. des Sci. Nat. 1st ser. xxi. 84, t. ii. f. 23-25.

GEOPLANIDÆ.

Corpus elongatum depressum v. depressiusculum, subtus pede sat distincto. Caput continuum v. discretum. Ocelli duo vel plurimi, in capite dispositi. Os post mediale. Oesophagus protractilis campanulatus, margine sæpius sinuoso. Apertura genitalis pone os. Terricolæ.

GEOPLANA, n. g. Corpus depressum v. depressiusculum, elongatum v. lineare, capite continuo. Ocelli numerosi marginales, v. in acervos submarginales, in capite dispositi.

G. vaginuloides. *Planaria vaginuloides*, Darwin, Ann. Mag. Nat. Hist. 1st ser. xiv. 244. *Polycelis vaginuloides* Diesing, Syst. Helminth. i. 172.

G. bilinearis. *Planaria bilinearis*, Darwin. l. c. xiv. 245. *Polycelis bilinearis*, Diesing, l. c. i. 194.

G. pulla. *Planaria pulla*, Darwin, l. c. xiv. 245. *Polycelis pulla*, Diesing, l. c. 192.

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G. pallida. *Planaria pallida*, Darwin, l. c. xiv. 245. *Polycelis pallida*, Diesing, l. c. i. 194.

G. Tasmanica. *Planaria Tasmanica*, Darwin, l. c. xiv. 246. *Polycelis tasmanica*, Diesing, l. c. i. 193.

G. nigro-fusca. *Planaria nigro-fusca*, Darwin, l. c. xiv. 245. *Polycelis nigro-fusca*, Diesing, l. c. i. 193.

G. lapidicola, infra.

BIPALIUM, n. g. Corpus lineare, depressiusculum. Caput discretum, lunatum, transversum, auriculis longis retrorsum tendentibus. Ocelli numerosi, minuti, in capite, plerumque in ejus marginibus dispositi. Os centrale v. post-centrale. Apertura genitalis inter os et extremitatum posteriorem, sæpius ad dimidiam distantias.

B. maculatum, fuscatum, trilineatum, et virgatum, infra.

RYNCHODERMUS, Leidy. (Proc. Acad. Nat. Sci. Philad. v. 589. 1851.) Corpus elongatum, subdepressum, antrorsum attenuatum, utrinque obtusum. Ocelli duo subterminales.

R. terrestris, Leidy, l. c. v. 289. *Planaria terrestris*, Dugès, Ann. d. Sci. Nat. 1st ser. xxi. 82, pl. 2, f. 18.

R. sylvatica, Leidy, l. c. v. 289. *Planaria sylvatica*, Leidy, l. c. v. 241.

POLYCLADIDÆ.

Corpus planum v. depressum oblongum, dilatatum, capite continuo. Ocelli nulli. Os subcentrale. Apertura genitalis anteos. Terricolæ.

POLYCLADUS, Blanchard, (Ann. des Sci. Nat. 3d. ser. viii. 146-149, 1845.) genus unicum.

P. Gayi, Blanch. l. c.

P. maculatus, Diesing, l. c. i. 201. *Planaria maculata*, Darwin, l. c. xiv. 246.

P. semilineatus, Diesing, l. c. i. 201. *Planaria semilineata*, Darwin, l. c. xiv. 246.

P. elongatus. *Planaria elongata*, Darwin, l. c. xiv. 246. *Polycladus Darwinii*, Diesing, l. c. i. 202.

Descriptions specierum novarum.

1. **THYSANOOZON AUSTRALE**, St. Proc. Acad. Nat. Sci. Philad. vii. 389. Corpus ovale, utrinque late rotundatum, supra fusco nigroque maculatum, papillis subæqualibus, regulariter dispersis, ad 60 obsessum. Papillæ sat grandes, fuscæ, tuberculis prominentibus flavis gemmatæ. Tentacula mediocria, graciliora. Ocelli conferti in acervum parvum, ovatum, postice macula alba cuneiformi interruptum. Long. 1; lat. 0.6 poll.

Hab. In portu Jacksoni Australiensi; inter spongas e profunditate sex orgyiarum.

2. **PROCNOS ALBICORNIS**. Late ovalis, supra fuscus, albo-punctatus, tentaculis albis. Ocelli magnitudine variabiles, in areola clara, magna, oblongo-ovali dispositi, majores anteriores. Long. 1.3; lat. 0.9 poll.

Hab. Ad oras insulæ "Jesso" Japoniæ Borealis; sublittoralis inter lapides algosos.

3. **EURYLEPTA FULMINATA**, St. l. c. vii. 380. Oblongo-ovalis, supra rubro-fusca, viridi-punctata, fasciis obliquis rufis fusco-marginatis, in medio convexitibus. Tentacula lata, approximata, macula flava ad basim anteriorem. Ocelli in acervum unicum in papilla minuta, ovali, cervicali, situm. Long. 1.25; lat. 0.58 poll.

Hab. Prope oras insulæ "Loo Choo"; inter corallia e profunditate orgyiarum duarum.

4. **EURYLEPTA COCCINEA**. Oblonga, utrinque rotundata, supra rubra, maculis albis inconspicuis; lateribus fere parallelis, marginibus purpureis undulatis. 1857.]

Tentacula minora, approximata. Ocelli in acervum minutum pone tentacula situm. Long 2; lat. 0.7 poll.

Hab. Ad insulam "Loo Choo"; sublittoralis in rupibus.

5. *EURYLEPTA GUTTATO-MARGINATA*, St. l. c. vii. 380. Oblongo-ovata, postice latior; supra alba, margine serie macularum pupurearum ornata. Tentacula brevia. Ocelli circiter 12 in acervum minutum pone tentacula situm. Long. 0.5; lat. 0.28.

Hab. Ad insulam "Loo Choo"; littoralis in rupium fissuris.

6. *EURYLEPTA INTERRUPTA*, St. l. c. vii. 380. Ovalis, supra pallide fusca, fascia longitudinali mediana nigra interrupta; marginibus linea ima aut extrema hyalina, 2da nigra, 3tia aurantiaca, 4ta vel interna, nigro-fusca et latiore; omnibus (antice excepta) frequenter interruptis. Tentacula prominentia. Ocelli cervicales in acervos duos lunatos, parallelos, antrorsum convexos aggregati. Long. 0.75; lat. 0.31 poll.

Hab. Ad oras insulæ "Loo Choo"; littoralis sub lapidibus in locis arenosis.

7. *EURYLEPTA NIGRA*. Elongato-elliptica, supra nigra, rufo-marginata, subtus albens. Tentacula minora, graciliora, nigra, ad apicem alba. Papilla ocellifera cervicalis, in linea alba longitudinali, mediana, brevi sita. Long. 3; lat. 0.9.

Hab. Ad oras insulæ "Ousima" Japoniæ Australis; littoralis inter rupes.

8. *EURYLEPTA JAPONICA*. Oblongo-ovalis, marginibus undulatis; supra fulva, albo punctata; tentaculis approximatis, prominentibus, subtriangularibus, acutis. Ocelli numerosi, magnitudine æquales, in areola parva, ovata, antice acuminata, juxta tentacula sita, conferti. Long. 2.9; lat. 2.9; lat. 1.3 poll.

Hab. Ad oras insulæ "Jesso" Japoniæ Borealis; sublittoralis inter lapides.

9. *CRYPTOCCELUM OPACUM*. Subovale, postice parum latiore, utrinque late rotundatum, colore nigro-purpureo-fuscum, marginibus incoloratis. Caput interdum depositione nigra irregulari, in loco usitata ocellorum acervorum. Long. 0.2; lat. 0.125, poll.

Hab. In portu Sinensi "Hong Kong;" parasiticum in *Echinarachnio* magno purpureo e profunditate sex orgyiarum.

10. *TYPHLOCOLAX ACUMINATUS*. Depressiusculus, gracilis, antice subattenuatus et truncatus, ad trientem posteriorem corporis partem latior et convexior; cauda acuminata. Colore supra sanguineus, maculis 2-3 nigris indistinctis ad summum dorsum. Long. 0.1; lat. 0.03 poll.

Hab. In freto Behringii; parasiticus in *Chirodotea* specie e profunditate decem orgyiarum.

11. *ELASMODES ACUTUS*. *Leptaplana acuta*, St. l. c. vii. 381. Lanceolatus, utrinque acutus, ante medium quam post medium vix latior, subpellucidus pallide griseus, bruneo-maculatus. Ocelli pauci in acervos duos, parvos, arcuatos, ab extremitate anteriore parum remotos. Long. 0.33; lat. 0.14 poll.

Hab. In portu Sinensi "Hong Kong;" in fundo limoso profunditatis sex orgyiarum.

12. *ELASMODES TENELLUS*. Elongato-ovatus, ad caput latior; hyalino-albus, supra macula elongata mediana pallide fusca. Ocelli inconspicui, in acervos duos elongatos sparsim dispositi. Lon. 1.6 poll.

Hab. Ad insulam "Ousima;" littoralis inter lapides.

13. *LEPTOPLANA SCHÖNBOERNII*. Parvula, ovata, pallida, supra minute cupreo-maculata. Ocelli in acervos duos oblongos, antice attenuatos ex secundariis, postice ex primariis constatos. Long. 0.2; lat. 0.1 poll.

Hab. Prope Promontorium Bonæ Spei; in fundo saxoso profunditatis 20 orgyiarum.

14. *LEPTOPLANA FUSCA*. Subelongata, utrinque rotundata, antice parum latior, supra fusca. Ocelli in areola incolorata, in acervos duos oblongos, quadrangulatos, antrorsum convergentes aggregati; primarii posteriores,

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secundarii anteriores, utrinque dimidium partem acervorum fermentes. Long. 0.75; lat. 0.25 poll.

Hab. Ad oras insulæ Sinensis "Hong Kong;" littoralis, sub lapidibus in locis saxosis.

15. *LEPTOPLANA TRULLIFORMIS*, St., l. c. vii. 381. Elongata, antice late rotundata, postice attenuata subacuta, supra pallide fusca, fascia mediana obscuriore pone ocellos. Ocelli in areola incolorata; primariorum acervi oblongi obliqui, antrorsum convergentes, utroque circiter 16; secundarii in acervos quinque, quorum tribus ante, duobus parvis pone primariorum acervos. Long. 0.75; lat. 0.22 poll.

Hab. In freto "Li-yu-moon," prope insulam Sinensem "Hong Kong;" in fundo lapidoso profunditatis 25 orgyiarum.

16. *LEPTOPLANA MACULOSA*. Oblongo-ovata; supra pallide grisea, maculis fuscis sparsis, medianis obscuris; marginibus hyalinis. Ocelli primarii in acervos duos ovatos aggregati, utroque septem; acervi in extremitatibus areolæ hyalinae, transversæ, arcuatæ, positi. Ocellorum secundariorum acervi duo parvi ante medium areolæ siti. Ocelli 4-6 in areola inter primarios dispersi. Long. 0.8; lat. 0.4 poll.

Hab. In portu "San Francisco" Californiæ; littoralis sub lapidibus in locis limosis.

17. *LEPTOPLANA DELICATULA*. Subovata, tenerrima, marginibus undulatis; supra rufo-fusca, versus marginem pallescens. Ocellorum primariorum acervi in umbonibus, utroque circiter 14. Ocelli secundarii valde numerosi, minuti, in acervos quatuor elongatos, ante et pone alteros sitos. Long. 0.6; lat. 0.3 poll.

Hab. In portu "Hong Kong;" littoralis inter ulvas in locis arenosis.

18. *LEPTOPLANA OBLONGA*. Subelongata, antice truncata v. subtruncata, postice attenuata et acuta, supra fusca versus marginem pallescens. Ocelli in areola hyalina; primarii in summa parte umbonum, utroque 8; secundarii in acervos elongatos arcuatos longitudinales duos inter primarios,—sparsi. Long. 1.8; lat. 0.45 poll.

Hab. In portu "Simoda" Japoniæ; sublittoralis in rupium fissuris.

19. *LEPTOPLANA HUMILIS*. Ovata, supra pallide griseo-brunnea, fasciis obscurioribus radiatim dispositis; fascia incolorata mediana interrupta. Ocelli primarii in umbonibus, utroque 12-15; secundarii inconspicui ante et pone primarios sparsi. Long. 1; lat. 0.7 poll.

Hab. Prope oras insulæ "Jesso"; in fundo arenoso profunditatis quatuor orgyiarum.

20. *LEPTOPLANA PATELLARUM*, St. l. c. vii. 389. Subovata, utrinque late rotundata, postice parum latior; supra fulva, fascia lata mediana et maculis obscurioribus; subtus alba. Ocelli primarii in umbonibus utroque circiter 10; secundarii in acervos duos oblongos approximatos ante primarios sitos. Long. 0.9; lat. 0.65 poll.

Hab. in "Simon's Bay" prope Promontorium Bonæe Spei; littoralis, in rupibus sub *Patellis* magnis reperta.

21. *LEPTOPLANA PUNCTATA*. Sat grandis, oblongo-ovata, tenuis, subpellucida, supra punctis rubro-fuscis regulariter adspersis, et fascia longitudinali mediani rubro-fusca, antice inter acervos ocellorum incipiente. Ocelli primarii in umbonibus parvis, utroque 8; secundarii in acervos duos parvos triangulares pone primarios et eis confluentes, utroque circiter 10.

Hab. Ad insulam "Ousima"; sublittoralis inter lapides algosos.

22. *DIOGUS RADIUS*, St. l. c. vii. 389. Ovalis, utrinque subtruncatus, supra badius, ex parte albo-punctatus. Ocelli numerosi minuti, superficiem totam umbonum translucidorum occupantes, utroque circiter 30. Long. 1.5; lat. 0.75 poll.

Hab. In portu Jacksoni Australiensi; littoralis sub lapidibus.

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23. *DIOXOUS OBLONGUS*, St. l. c. vii. 389. Oblongo-ovalis, supra pallide fusco-griseus. Ocellorum acervi in summa parte umbonum pellucidorum siti, ita annulo hyalino simulate cincti. Ocelli subgrandes circiter 15 in utroque acervo. Long. 1; lat. 0.35 poll.

Hab. In portu Jacksoni; littoralis.

24. *PACHYPLANA LACTEA*. Exacte ovata, lactea, prope marginem obscurior lineis granulæ (ova?) radiantibus et divisis. Papillæ ocelliferæ parvæ, ad partem quintam anteriorem corporis longitudinis sitæ, et parte sexta latitudinis remotæ. Ocelli magni sex in utroque papilla; alii pauci minuti in margine anteriore. Long. 1.5; lat. 1 poll.

Hab. Ad oras insulæ "Ousima"; sublittoralis in locis lapillosis et algosis sub lapidibus magnis.

25. *PROSTHIOSTOMUM GRANDE*. Valde elongatum, antice subtruncatum retrorsum attenuatum acutum; colore supra pallide fulvum, sparsim rubro-maculatum; fascia longitudinali mediana fusca reticulata. Ocelli occipitales in acervum elongato-triangulari, longitudinaliter linea mediana bisectum, ad vicesimam partem anteriorem corporis situm. Ocelli marginales in margine frontali modo dispositi. Long. 6; lat. 0.4 poll.

Hab. Ad oras insulæ "Ousima"; sublittorale.

26. *PROSTHIOSTOMUM OBSCURUM*. *Leptoplana obscura*, St. l. c. vii. 381. Elongato-ovale, antice subtruncatum, supra pallide rubro-fuscum, sæpe rufo-maculatum, fascia mediana pallidiore. Ocellorum acervus occipitalis e linea mediana bipartitus; utrinque linearis ocellis 3-4 magnis, et 5-6 parvis posterioribus divergentibus. Ocelli reliqui submarginales, frontales tantum, sparsi. Long. 1; lat. 0.34 poll.

Hab. In portu "Hong Kong"; sublittoralis in locis arenosis et algosis.

27. *PROSTHIOSTOMUM AFFINE*. Elongatum, antice subtruncatum et in medio sinuatum supra rufo-variegatum, fascia longitudinali mediana obscuriore. Ocelli minuti, in lateribus areolæ pellucidæ, parvæ conferti, et secundum marginem anteriorem dense distributi. Os infra ad partem sextam corporis situm. Œsophagus protractilis in tubo elongato, subclavato, truncato, prope extremitatem constricto. Long. 0.9; lat. 0.2 poll.

Hab. In portu Sinensi "Hong Kong"; littorale inter ulvas in locis arenosis.

28. *PROSTHIOSTOMUM COLLARE*. *Leptoplana collaris*, St. l. c. vii. 381. Oblongum, antice truncatum, fronte sepius concava; postice attenuatum acutum; snrabadium, lineis longitudinalibus fuscis duobus in corpore, unica mediana in capite; fascia transversa alba cervicali. Ocelli numerosi in acervum occipitalem v-formem, antrorsum acutum. Ocelli marginales? Long. 0.5; lat. 0.29 poll.

Hab. Ad oras insulæ "Loo Choo"; sublittorale inter algas in rupium fissuris.

29. *PROSTHIOSTOMUM CONSTIPATUM*. Oblongum, utrinque rotundatum, supra punctis numerosis obscure fulvis, postice in medio confertis; antice fascia pallida longitudinali mediana, Œsophagi positionem indicante. Ocelli acervi occipitalis pauci, inæquales, in areola pellucida, ovali, bilobata adpersi; reliqui numerosi æquales in acervum arcuatum a margine anteriore paullo remotum. Long. 1; lat. 0.27 poll.

Hab. Ad oras insulæ "Jesso" Japoniæ Borealis; sublittorale inter lapides.

30. *PROSTHIOSTOMUM CRIBARIUM*. Oblongum, lateribus fere parallelis, extremitate anteriore subtriangulari, in verticem obtusum finiente; extremitate posteriore late rotundata; colore supra fusco-rufum, maculis parvis incoloratis confertis; margine lactea. Ocelli valde numerosi, in acervum hippocrepi formem, magnum, prope verticem situm, conferti. Ocelli marginales pauci, secundum marginem anteriorem irregulariter adpersi. Long. 2; lat. 0.9 poll.

Hab. Prope oras insulæ "Jesso"; in fundo arenoso et algoso profunditatis sex orgyiarum.

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31. *PROSTHIOSTOMUM CRASSIUSCULUM*. Elongate ovale, crassiusculum, supra obscure fuscum, subtus pallide rufum. Ocelli occipitales numerosi, minuti, acervum ovalem formantes in areola pellucida ad partem septimam anteriorem corporis sita; ocelli marginales in margine frontali et antero-laterali, post acervum occipitalem extensi. Long. 2·3; lat. 0·9 poll.

Hab. Ad insulam "Ousima"; littorale inter lapides.

32. *PROSTHIOSTOMUM TENEBROSUM*. Elongatum, utrinque rotundatum, supra obscure griseum vel subnigrum, areola ocellifera vix pallidiore, itaque ocellorum acervus ovalis occipitalis non bene distinctus. Margo pellucida; ocelli marginales antice distincte aperti. Long. 2; lat. 0·3 poll.

Hab. In portu "Hong Kong"; littorale sub lapidibus in locis arenosis.

33. *PROSTHIOSTOMUM SPARSUM*. *Leptoplana sparsa*, St. l. c. viii. 381. Suboblongum, antice late rotundatum postice parum angustatum acutum; supra pallide fuscum unicolore, interdum macula obscuriore prope extremitatem posteriorem. Ocelli numerosi aequales in acervum ellipticum occipitalem aggregati; interdum utrinque acervo minuto inconspicuo. Ocelli marginales in marginibus anterioribus et antero-lateralibus conferti. Long. 1; lat. 0·5 poll.

Hab. In portu insulae "Kikaisima"; Japoniae Australis; sublittorale inter confervas.

34. *DIPLOCHUS MARMORATUS*. Oblongo-ellipticus, antice subangustatus, postice rotundatus, supra brunneus, maculis albis reniformibus marmoratus. Ocelli in papilla elliptica bilobata; alii in acervum linearem ab hac papilla antrorsum extensum. Long. 3·3; lat. 1·4 poll.

Hab. Ad oras insulae "Ousima"; sublittoralis inter lapillos.

35. *STYLOCHUS CORNICULATUS*, St. l. c. vii. 381. Oblongus, extremitatibus late rotundatis; supra fulvo-maculatus. Tentacula triangulato-pyramidalia facie exteriori ocellis minutis ubique confertis. Areola clara circularis sine ocellis inter tentacula sita. Long. 2; lat. 0·1 poll.

Hab. In portu "Hong Kong"; in conchis bivalvis desertis e fundo limoso profunditatis 6 orgyiarum.

36. *STYLOCHUS OBSCURUS*. Subovatus, antice latior, supra obscure glaucus, maculis subnigris, in linea mediana confertis. Tentacula parva, inconspicua in corpore obscuro. Areola pellucida nulla. Ocelli numerosi, minuti, superficiem tentaculorum totam tegentes. Long. 1·7; lat. 1 poll.

Hab. Ad oras insulae "Jesso"; sublittoralis.

37. *STYLOCHOPLANA TENERA*. Ovato-cordata, pertenuis, capite dilatato. Corpus hyalinum, supra fasciis duobus centralibus pallide griseis. Tentacula in areola pura. Ocelli in acervum transversum inter tentacula utrinque ad eorum basim extensum. Long. 0·9; lat. 0·6 poll.

Hab. In mari Atlantico inter 20° et 30° lat. bor.; pelagica.

38. *STYLOCHOPLANA RETICULATA*. *Stylochus reticulatus*, St. l. c. vii. 381. Late ovata, supra pallide brunnea, fusco-maculata, filis nigro-punctatis reticulata. Tentacula et ocelli in areola clara ad quartam anteriorem corporis sita. Ocelli in acervos quatuor dispositi, quorum duo ad basim anteriorem tentaculorum, et duo inter et ante tentacula siti. Long. 2; lat. 1·5 poll.

Hab. Ad oras insulae "Loo Choo"; sublittoralis in rupium fissuris.

39. *CALLIOPLANA MARGINATA*. Ovalis, tenuis; supra nigro-fuscus margine cinnabarino. Tentacula parva, approximata, gracilia, styliformia, ad apicem truncata; in areola alba, parva, lunata, transversa sita. Ocelli ad latus anteriorem tentaculorum prope basim, et in acervos duos lineares inter tentacula. Long. 2·4; lat. 1·1 poll.

Hab. Ad oras insulae "Ousima"; sub lapidibus in profunditate 4 pedum.

40. *STYLOCHOPSIS CONGLOMERATA*. Oblongo-ovalis, antice subtruncatus aut late rotundatus, structura paullo crassa; supra pallide griseus, maculis nigri-1857.]

cantibus angularibus acute definitis, confertis. Tentacula remota, brevia, ad apicem obtusa. Ocelli magni in tentaculis, alii minuti in aevrum rhomboidalem inter et post tentacula; reliqui in margine anteriore sparsim distributi. Long. 1.4; lat. 0.55 poll.

Hab. Ad insulam "Ousima"; sub lapidibus in profunditate pedum duorum.

41. *STYLOCHOPSIS LIMOSUS*. Amplus, oblongo-ovalis, crassiusculus, sed molli et mucosus; supra pallide fuscus, maculis oblongis, parvis, numerosis, griseo-fuscis adpersus. Tentacula remota. Ocelli ad tentacula et in margine anteriore corporis sparsim distributi. Long. 3; lat. 1.3 poll.

Hab. in sinu insulae "Ousima;" sublittoralis in fundo arenoso et algoso sub lapidibus.

42. *TRACHYPLANA TUBERCULOSA*. Oblongo-ovalis, structura paullo firma et dura, tuberculis minutis supra obsessus; colore flavus, tuberculis carnea. Tentacula parvula, hyalina. Ocelli pauci in superficie tota tentaculorum sparsim dispositi. Long. 1.4; lat. 0.6 poll. *Hab.* in sinu insulae "Ousima;" inter lapides e profunditate 4 pedum.

43. *PLANARIA SINENSIS*. Oblonga, postice acuta; fronte obtuse triangulari, in medio valde producta; auriculis parvulis, capite quam corpore latitudine minore. Colore corpus supra variabile, nigrum, fuscum v. fulvum; margine hyalina; macula hyalina stomachali mediana. Pigmentum ocellorum rotundatum, in globulo vitreo ovali, ad latus internum approximatum. Long. 0.5; lat. 0.16 poll.

Hab. in rivulis insulae Sinensis "Hong Kong."

44. *PLANARIA CINEREA*. Oblonga, subconvexa, postice attenuata, lateribus leviter convexis; fronte triangulari, in media paullo producta; auriculis mediocribus. Corpus colore supra cinereum, fascia mediana subpinnata obscuriore. Ocelli auriculis oppositi; pigmento ovali ad latus internum globuli mediocri. Long. 0.4; lat. 0.11 poll.

Hab. in fossis insulae "Ousima," Japoniae Australis.

45. *PLANARIA RADIA*. Oblonga, convexuscula, postice acuta, lateribus leviter convexis; fronte acute triangulato-producta; auriculis mediocribus. Corpus colore supra badium, ad caput pallidus; macula stomachali oblonga pellucidula post-mediali. Ocelli auriculis oppositi; pigmento substellato ad latus internum globuli sat magni. Long. 0.4; lat. 0.09 poll.

Hab. in fossis insulae "Loo Choo."

46. *FOVIA GRACILIONPS*. Gracilis, supra grisea, post medium latior et convexior, antice angustata; capite valde elongato, gracili; fronte acute triangulata, cervice vix latiore; auriculis nullis. Cauda apiculata. Ocelli approximati, ad quintam anteriorem corporis siti; pigmento reniformi. Long. 0.2; lat. 0.04 poll.

Hab. in portu "Hong Kong;" littoralis in locis arenoso-limoso.

47. *FOVIA TRILORATA*. Oblonga, depressa, antrorsum subangustata, retrorsum rotundata; supra rubra, fascia mediana pallidiore, et linea transversa nigricante pene ocelles; subtus alba. Ocelli octavam partem corporis ab apice remoti; pigmento semicirculari ad latus internum globulorum ovalium. Long. 0.2; lat. 0.06 poll.

Hab. in sinu "Avatscha" Kamtschatka; littoralis inter lapides.

48. *GEOPLANA LAPIDROOLA*. Elongata, subconvexa, post medium parum latior, lateribus fere parallelis, extremitatibus rotundatis; supra grisea, fascia mediana fulva, marginibus pallidis. Ocelli vix numerosi in lateribus extremitatis anterioris sparsi, majores utrinque 3-4 latero-frontales. Long. 1.2; lat. 0.1 poll.

Hab. ad insulam "Loo Choo;" sub lapillis in sylvis.

49. *BIPALMUM VIRGATUM*. Sat gracile, postice obtusum; ad cervicem angustatum. Auriculæ capitis graciles sepius retrorsum curvatae. Frons arcuata, in medio leviter sinuata. Corpus colore supra pallide aurantiacum, fasciis nigro-fulvis quinque longitudinalibus, lateribus marginalibus, — virgatum; fasciis me-

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diana sola caput transiente. Ocelli valde numerosi, in marginibus capitis et cervicis dense distributi. Long. 2; lat. 0.15 poll.

Hab. ad insulam "Loo Choo"; inter lapillos et folia putrida.

50. *BIPALIMUM MACULATUM*. Subdepressum; capite auriculis sat brevibus, fronte arcuata. Corpus supra fulvum, maculis nigris confertis, fascia mediana pallida nigro-marginata; auricularum marginibus posterioribus nigris. Ocelli valde numerosi in acervum arcuatum frontalem submarginalem. Long. 3; corporis lat. 0.2; capitis lat. 0.3 poll.

Hab. ad insulam "Ousima;" sub foliis et lignis putridis in humidis.

51. *BIPALIMUM TRILINEATUM*. Elongatum, retrorsum attenuatum acutum; cer-vice subangustata; margine posteriore auricularum recta. Frontis margo 10-dentata, dentibus parvis distantibus. Corpus colore supra pallide flavo-fuscum, in medio longitudinaliter nigro trilineatum; marginibus capitis et cervicis nigris. Ocelli numerosi submarginales in capite. Long. 1.6; corporis lat. 0.22; capitis lat. 0.33 poll.

Hab. in collibus insulæ "Jesso;" inter folia putrida.

52. *BIPALIMUM FUSCATUM*. Grande, depressum, postice attenuatum acutum; supra nigro fuscum, margine frontali pallida. Ocelli in marginibus capitis sparsi. Long. 5; lat. 0.3 poll.

Hab. prope urbem Japonicam "Simoda" sub foliis putridis.

Description of Thirteen New Species of UNIONES, from Georgia.

BY ISAAC LEA.

UNIO BLANDIANUS. Testâ tuberculatâ, subquadratâ, subinflatâ, subæqui-laterali, anticè rotundatâ, ad basim emarginatâ; valvulis percrassis, anticè crassioribus; natibus elevatis, compressis, ad apices granulatis; epidermide vel castaneâ vel luteo-fuscâ; dentibus cardinalibus magnis, percrassis, crenulatis, in utroque valvulo duplicibus; lateralibus rectis, brevibus, percrassis crenula-tisque; margaritâ argenteâ et iridescente.

Hab. Othcalooga Creek, Gordon county, Georgia. Bishop Elliott.

UNIO CONCRESTATOR. Testâ lævi, ellipticâ, inflatâ, inæquilaterali, anticè rotun-datâ; valvulis subcrassis, anticè crassioribus; natibus prominulis; epidermide nigricanti, eradiatâ, transversè striatâ; dentibus cardinalibus subcrassis, du-plicibus, crenulatisque; lateralibus longis subcurvisque; margaritâ vel pur-pureâ vel salmonis colore tinctâ et iridescente.

Hab. Creeks near Columbus, Georgia. Bishop Elliott.

UNIO EXTENSUS. Testâ lævi, valdè transversâ, valdè compressâ, ad latere planulatâ, valdè inæquilaterali, posticè subangulatâ; valvulis subcrassis; nati-bus prominulis, compressis; epidermidè tenebroso-fuscâ, transversè striatâ; dentibus cardinalibus subcrassis, acuminatis; lateralibus prælongis, rectis, posticè incrassatâ; margaritâ albâ et iridescente.

Hab. Dry Creek, near Columbus, Georgia. Bishop Elliott.

UNIO PYRIFORMIS. Testâ lævi, obliquâ, oviformis, valdè compressâ, valdè in-æquilaterali, posticè biangulatâ; valvulis subcrassis, anticè crassioribus; natibus subprominentibus; epidermide luteo-castaneâ, nitidâ; dentibus cardinalibus subgrandibus crenulatisque; lateralibus subbrevibus subcrassisque; margaritâ vel salmonis colore tinctâ vel albâ et iridescente.

Hab. Near Columbus, Georgia. Bishop Elliott.

UNIO COLUMBIENSIS. Testâ lævi, oblongâ, subinflatâ, valdè inæquilaterali, posticè angulatâ; valvulis subcrassis; natibus prominulis et concentricè undu-latis; epidermide tenebroso-fuscâ; dentibus cardinalibus subgrandibus, elevatis, 1857.]

acuminatis crenulatisque; lateralibus prælongis, lamellatis subrectisque; margaritâ albâ et iridescente.

Hab. Creeks near Columbus, Georgia. Bishop Elliott.

UNIO FALLAX. Testâ lævi, ellipticâ, subinflata, inæquilaterali, anticè et posticè regulariter rotundatâ; valvulis subtenuibus; natibus prominulis, ad apicem minutè undulatâ; epidermide luteo-fuscâ, valdè radiatâ; dentibus cardinalibus erectis, compressis, acuminatis; lateralibus subrectis sublongisque; margaritâ vel albâ vel purpureâ vel salmonis colore tinctâ.

Hab. Streams near Columbus, Georgia. Bishop Elliott; and French Broad River, Tenn., Mr. Joseph Clark.

UNIO INTERCEDENS. Testâ lævi, ellipticâ, subinflata, valdè inæquilaterali, posticè subangulatâ; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscâ, posticè radiatâ, anticè subsulcatâ; dentibus cardinalibus parvis, angulatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subrectisque; margaritâ purpureâ.

Hab. Streams near Columbus, Georgia. Bishop Elliott.

UNIO EXCAVATUS. Testâ lævi, subtriangulari, valdè inflata, subæquilaterali, posticè angulatâ; valvulis subcrassis, anticè crassioribus; natibus valdè prominentibus et tumidis; epidermide vel luteâ vel luteo-olivâ, politâ, radiatâ, anticè subsulcatâ; dentibus cardinalibus magnis, erectis, conico-compressis, crenulatis, in utroque valvulo duplicibus; lateralibus subbrevibus, lamellatis crassisque; margaritâ albâ et iridescente.

Hab. Othcalooga Creek, Gordon County, Georgia; Bishop Elliott; and Etowah, Georgia, Rev. Geo. White. Alabama river, Claiborne, Alabama, Judge Tait.

UNIO RADIANUS. Testâ lævi, ellipticâ, subinflata, inæquilaterali, posticè rotundatâ; valvulis subtenuibus, anticè crassioribus; natibus prominulis, ad apices undulatis; epidermide luteâ, politâ, valdè radiatâ; dentibus cardinalibus subgrandibus, erectis, subconicis crenulatisque; lateralibus sublongis, lamellatis subrectisque; margaritâ vel albâ vel rosaceâ et valdè iridescente.

Hab. Othcalooga Creek, Gordon county, Georgia. Bishop Elliott.

UNIO RUBELLINUS. Testâ plicatâ, transversâ, subtriangulari, subinflata, valdè inæquilaterali, posticè acutè angulatâ, anticè rotundatâ; valvulis subcrassis, anticè crassioribus; natibus prominulis, ad apices undulatis; epidermide rubi-usculâ, nitidâ; dentibus cardinalibus parvis, erectis acuminatisque; lateralibus longis lamellatis subrectisque; margaritâ rubidâ et iridescente.

Hab. Othcalooga Creek, Gordon county, Georgia. Bishop Elliott.

UNIO UMBROSUS. Testâ lævi, ellipticâ, ventricosâ, subæquilaterali, posticè obtusè angulatâ, compressâ et emarginatâ; valvulis crassis, anticè crassioribus; natibus prominulis; epidermide tenebroso-fuscâ, posticè obsoletè radiatâ; dentibus cardinalibus subgrandibus, erectis, obtuso-conicis; lateralibus sublongis, subrectis subcrassisque; margaritâ tenebroso-purpureâ et iridescente.

Hab. Othcalooga Creek, Gordon county, Georgia. Bishop Elliott.

UNIO APICINUS. Testâ lævi, ellipticâ, subcompressâ, subæquilaterali, posticè obtusè angulatâ; valvulis subtenuibus; natibus prominulis, ad apices regulariter et decorè undulatis; epidermide fusco-lutescente, radiis minutis induta; dentibus cardinalibus parvulis, obliquis, compressis, subacutis crenulatisque; lateralibus sublongis, lamellatis subcurvisque; margaritâ albidâ et iridescente.

Hab. Othcalooga Creek, Gordon county, Georgia. Bishop Elliott.

UNIO OTHCALOOGENSIS. Testâ lævi subtriangulari, ventricosâ, subæquilaterali; valvulis crassis, anticè crassioribus, natibus subgrandibus, ad apices undulatis; epidermide lutescente, perlævi, nitidâ, eradiatâ; dentibus cardinalibus crassis, obliquis, crenulatis et in utroque valvulo duplicibus; lateralibus brevibus subrectisque; margaritâ albâ et iridescente.

Hab. Othcalooga Creek, Gordon county, Georgia. Bishop Elliott.

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Catalogue of Birds collected on the River Muni, Western Africa, by Mr. P. B. DuChaillu in 1856, with notes and descriptions of new species.

BY JOHN CASSIN.

The collection of birds, of which the succeeding is a catalogue, was made by Mr. DuChaillu during a journey up the River Muni, made with the hope of being able to reach the supposed source of the River Congo as laid down in recent maps. In this, however, he did not succeed, being prevented by ranges of high mountains, and the fact that the nations of negroes at the extreme point attained by him were unwilling to allow any of their people to accompany him, and apparently knew nothing of the nations beyond those mountains. He penetrated to a distance of 250 to 300 miles from the coast, and traced the Muni to its source.

As at Cape Lopez, Mr. DuChaillu did not collect birds of which numerous specimens had formerly been sent in his collections from the Gaboon and from the Moondah. This fact will account for the absence of some well known species from the present catalogue.

Mr. DuChaillu is at present about to undertake the ascent of the River Camma, lat. about 1.30 S., again hoping to reach the Congo, and if successful will attempt its ascent to its source. With this journey he will occupy the present year, and is amply provided with the necessary equipment for his arduous and perilous undertaking, through the liberality of gentlemen of this Academy.

1. *GYPHOIEA ANGOLENSIS*, (Gmelin.)
Falco angolensis, Gm. Syst. Nat. i. p. 252, (1788.)
Gray's Genera, i. pl. 4. *Jard. & Selby*, Ill. Orn. pl. 13.
 Adult specimens.
2. *POLYBOROIDES RADIATUS*, (Scopoli.)
Vultur radiatus, Scop.
Polyboroides typus, Smith.
Temm. Pl. Col. 307; *Smith Ill. S. Af. Zool. Birds* pl. 81, 82.
 Several shades darker than any specimen in the Museum of the Academy or as represented in the plates cited. The fine cinereous color of this bird's plumage probably fades very readily. Adult specimens in the present collection.
3. *CHAUNONOTUS SABINI*, (J. E. Gray.)
Thamnophilus Sabini, Gray, *Zool. Misc.* p. 7, (1842.)
Jard. & Selby, Ill. Orn. N. S. pl. 27.
 Apparently not abundant in Equatorial Africa. One specimen only in this collection and one other only has been received in Mr. DuChaillu's collections. Adult, very nearly as figured above, but never, I think, having had quite so fierce an eye as in the plate above cited.
4. *LANIARIUS PELI*, (Bonaparte.)
Malaconotus Peli, Bonap. *Consp. Av.* p. 360, (1850.)
Laniarius lepidus, Cassin, *Proc. Acad. Philada.*, vii. p. 327, (1855.)
5. *TRICOPHORUS CALURUS*, Cassin.
Tricophorus calurus, Cassin, *Proc. Acad. Philada.*, viii. p. 158, (1856.)
6. *TRICOPHORUS NOTATUS*, Cassin.
Tricophorus notatus, Cassin, *Proc. Acad. Philada.*, viii. 158, (1856.)
7. *TRICOPHORUS TRICOLOR*, nobis.
 Allied to the preceding (*T. notatus*) but much smaller, and having the colors different. Bill nearly straight, culmen distinct; wing with the fifth and sixth quills longest; tail moderate.
 Total length (of skin) about 6½ inches, wing 3, tail 3 inches.
 Tail and its upper coverts dark chestnut, tinged with green on the outer edges of the feathers and paler beneath. Upper parts dark olive green, darkest on the 1857.]

head. Under parts yellow, clear and deeper on the throat; breast and middle of the abdomen tinged with greenish on the sides and flanks; under tail coverts pale yellow; exposed ends of secondary quills chestnut brown; primaries edged with greenish yellow on their outer webs. Bill dark, both mandibles tipped and with their cutting edges white; legs light bluish.

Sexes very nearly alike, females slightly smaller.

Hab. River Muni, Western Africa. Discovered by Mr. P. B. DuChaillu.

This is a small straight billed species belonging to the same group as our *T. notatus* and *T. canicapillus*, Hartlaub. It may be easily distinguished by its straight bill and chestnut colored tail, both of which characters strongly mark all of the specimens now before me, through some are evidently not in adult plumage.

The present bird appears to be allied also to *T. olivaceus*, Swainson, and to *T. icterinus*, Temm. Bonap. Cons. Av. p. 262. It is, however, but a distant relative of *T. barbatus*, Temm. Pl. Col. 88, not belonging to the same subgeneric group, and the description of *T. icterinus*, consisting as it does simply of a statement: "*Similis* Tr. barbato, *sed duplo minor*," is too careless and indefinite to be entitled to any consideration.

Six specimens have been received from Mr. DuChaillu, five of which are in the present collection and one in that from the River Moonda, formerly received.

8. *IXOS ASHANTEUS*, Bonaparte.

Ixos ashanteus, Bonap. Cons. Av. p. 266.

9. *ANDROPADUS LATIROSTRIS*, Strickland.

Andropadus latirostris, Strickl., Proc. Zool. Soc., London, 1844, p. 100.

Fraser, Zool. Typ. pl. 35?

Very fine adult specimens, with the yellow stripe on each side of the throat strongly marked. Sexes alike. I am not quite sure that Mr. Fraser's plate as above represents this species.

10. *ANDROPADUS VIRENS*, nobis.

Smaller than either *A. gracilirostris*, *latirostris* or *importunus*, but most resembling the last. Bill wide at base, rather short, cutting edge of the upper mandible distinctly crenated near the tip; wing moderate, rounded, fourth and fifth quills longest and nearly equal; tail rather short, with the feathers wide, plumage of the rump long, ample, soft; feet moderate.

Total length, about 6 inches, wing 3, tail 2½ inches.

Colors generally resembling those of *A. importunus*, but with the tail in the present species dark greenish brown. Entire plumage above dark olive green, rather lighter on the rump; upper tail coverts tinged with brown. Under parts yellowish green, the yellow predominating on the middle of the abdomen and under tail coverts. Inferior coverts of the wing light greenish yellow; quills edged on their inner webs with yellowish white. Tail greenish brown with the feathers slightly edged with yellowish green. Bill dark; legs light colored.

Hab. Cape Lopez and River Muni, Western Africa. Discovered by Mr. P. B. DuChaillu.

This is a smaller species than any hitherto known of this genus. It resembles in general appearance *A. importunus*, but can at once be distinguished by its smaller size and the more decided brown color of its tail, in which character it is more like the other two species mentioned above. This bird and *A. gracilirostris* and *latirostris* are evidently abundant species of Equatorial Western Africa, numerous specimens of each being in the collections of Mr. DuChaillu.

11. *PLATYSTIRA MELANOPTERA*, (lin.)

Muscicapa melanoptera, Gm. Nat. i. p. 939, (1788.)

Buff. Pl. Enl. 567, fig 3; Jard. ex. libv. III. n. i. pl. 9.

Evidently an abundant sp. s. thm. " eastern Africa.

The present collection consists of a young female which has the throat and breast marked as a young female which has spots of the chestnut of the adult.

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12. *PLATYSTIRA LEUCOPYGIALIS*, Fraser.*Platystira leucopygialis*, Fraser.

Fraser, Zool. Typ. Birds, pl. 34.

A beautiful and apparently abundant Flycatcher of Equatorial Africa.

Specimens of both sexes are precisely as figured above.

13. *MUSCIPETA FLAVIVENTRIS*, Verreaux.*Muscipeta flaviventris*, Verr. Cab. Jour. 1855, p. 103.14. *MUSCIPETA MELANOASTRA*, Swainson.*Muscipeta melanogastra*, Sw. B. of W. Af. ii. p. 55.15. *BUTALIS EPULATUS*, Cassin.*Butalis epulatus*, Cassin, Proc. Acad. Philada., vii. p. 326, (1855.)

Several specimens of this little species are in the present collection, all of which are but very slightly different from our specimens as above described. Some specimens have, however, the under mandible entirely yellowish white, and the color of the tarsi and toes is much lighter, being in fact pale yellowish. The present specimens are more recent than the former.

16. *BUTALIS COMITATUS*, nobis.

Intimately allied to, and resembling the preceding, but much larger, with the under mandible entirely dark colored and all the plumage darker.

Bill wide at base with very strong bristles; wing rather long, fourth quill longest; tail moderate, with the feathers rather pointed.

Total length about 5 inches, wing $2\frac{1}{2}$, tail $2\frac{1}{4}$ inches.

Entire upper parts dark cinereous, lighter on the rump, a narrow line of black around the neck behind. Quills and tail brownish black. Throat and middle of the abdomen white, breast and flanks dark cinereous. Inferior wing coverts ashy white, inner edges of quills white. Bill dark.

Hab. Muni river, Western Africa. Discovered by Mr. P. B. DuChailu.

Much resembling *B. epulatus*, but larger and easily distinguished. One specimen in the present collection is all that I have seen.

17. *MUSCICAPA MCCALLII*, (Cassin.)*Muscicapra McCallii*, Cassin, Proc. Acad. Philada., vii. p. 326, (1855.)

Presenting no characters differing from those given in the original description. A second specimen of this curious little bird is in the present collection. It does not belong to the genus *Pycnosphrys*, a specimen of the type of which is now in the Museum of the Academy. The present bird has a strong and rather wide bill, numerous long bristles and a rather long tail. In form only (not in color) it resembles the genus *Tyrannula*. My leisure at present will not warrant an extended examination.

18. *DRYMOICA BAIRDII*, Cassin.*Drymoica Bairdii*, Cassin, Proc. Acad. Philada., vii. p. 327, (1855.)

Not different in any respect from the specimens originally described by me, and strongly characterized by the uniform and numerous transverse stripes of the under parts from the base of the under mandible to the inferior tail coverts including the *tibiae*.

19. *SYNCOPTA TINCTA*, Cassin.*Syncoptes tinctoria*, Cassin, Proc. Acad. Philada., vii. p. 315, (1855.)20. *CAMPEPHAGA NIGRA*, Vieillot.*Campephaga nigra*, Vieill.

Le Vaill. Ois. d'Af. pl. 165.

Very similar to specimens in the museum from Southern Africa.

21. *CORVUS CURVIROSTRIS*, Gould.*Corvus curvirostris*, Gould, Proc. Zool. Soc., London, 1836, p. 18.

Jard. & Selby, Ill. Orn. N. S. pl. 33.

A very handsome and strongly marked species.

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22. *LAMPROCOLIUS SPLENDIDUS*, (Vieillot.)

Turdus splendidus, Vieill.

Lamprotornis chrysotis, Swains. B. of W. Af. i. p. 143, pl. 6.

23. *LAMPROCOLIUS PURPUREICEPS*, Verreaux.

Lamprocolius purpureiceps, Verr. Rev. et. Mag. 1851, p. 418.

24. *SYCOBIUS CRISTATUS*, (Vieillot.)

Malimbus cristatus, Vieill.

Tanagra malembica, Daudin, Ann. du Mus. ii. p. 148.

Vieill. Ois. Chant. pl. 42.

The adult of this species is very easily recognized, but the young is different. In some specimens there is no appearance of the crest, and the entire head and neck is of a dull brick red; the other plumage dull brownish black. In one specimen, evidently young, the head above is of the same dull brownish black with a few red feathers intermixed.

25. *SYCOBIUS SCUTATUS*, Cassin.

Sycobius scutatus, Cassin, Proc. Acad. Philada.

Jour. Acad. Philada., Quarto, i. pl. 41.

Males only, precisely similar to those described as above cited.

The female of this species bears some resemblance to that immediately succeeding, but may at once be distinguished by its under tail coverts being scarlet.

26. *SYCOBIUS NITENS*, (J. E. Gray.)

Ploceus nitens, Gray, Zool. Misc. p. 7. (1842.)

Gray, Gen. of Birds, i. pl. 87, fig. 2.

One of the most beautiful species of this genus. Mr. Gray's specimen figured as above was scarcely as mature as several that are in the present collection.

27. *SYCOBIUS RACHELLÆ*, nobis.

Rather smaller than *S. scutatus*. General form short and rather heavy; bill stout; wing moderate, third quill longest; tail rather short. Total length about 5½ inches, wing 3½, tail 2 inches.

Head above bright reddish orange, a paler shade of which extends on to the sides of the neck. Throat and cheeks black, which color includes the eyes. Neck before and breast bright orange red, immediately fading into bright yellow and extending on the sides further than on the middle of the breast. Entire upper parts, wings and tail and abdomen deep black, which color on the abdomen runs into a point on the middle of the lower part of the breast. Under tail coverts yellow. Under wing coverts black. Bill and feet dark.

Hab. River Muni, Western Africa. Discovered by Mr. P. B. DuChaillu.

This is a beautiful and quite peculiar species in its colors and general appearance. It is the only one in which the colors of the breast extend on the sides, as may be seen in some species of *Euplectes* (for instance in *E. melanogaster* (Lath.) Vieill. Ois. Chant. pl. 27). On the neck and breast the rich orange red is most distinct immediately next to and below the black of the throat, and rather suddenly fades into bright and clear yellow on the sides of the breast. Two specimens are in the collection.

Not wishing nor ever intending to pursue science as a cold abstraction, nor as an object of selfish ambition, I have named many birds in commemoration of my friends, and hope to do so again. For this I have the example of the greatest zoologists, and of none more conclusively than that of the great founder of modern systematic Zoology, who applied this description of names, especially to genera of plants, more extensively than any other naturalist has done in any department of Natural History.

By this token, I name the present beautiful bird after my loved and only daughter. Should her pathway in the world be pleasant, may she know also the great gratification that comes from the pursuit of Natural History; but if like her namesake of ancient days she shall go on her way weeping, may she have

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for her comfort the conscience, patience and moral excellence of her mother, with whatever of the good of the character of her father those who know him best may accord to him!

28. *ESTRElda atricapilla*, Verreaux.

Estrelda atricapilla, Verr. Rev. et Mag. de Zool. 1841, p. 421.

29. *NIGRITA canicapilla*, (Strickland.)

Æthiops canicapilla, Strickl. Proc. Zool. Soc., London, 1841, p. 30.

Fraser, Zool. Typ. Birds, pl. 48.

30. *PASSEr SWAINSONII*, (Rüppell.)

Pyrgita Swainsonii, Rüpp. Faun. Abyss.

Pyrgita simplex, Swains. B. of W. Af. i. p. 208.

Rüpp. Faun. Abyss. Birds, pl. 33, fig. 2.

Not distinguishable from specimens in the Museum of the Academy labelled as coming from various localities in Southern and Eastern Africa.

31. *CORYTHAIX PERSA*, (Linnæus.)

Cuculus persa, Linn. Syst. Nat. i. p. 171, (1766.)

Edward's Birds, pl. 7.

Received in every collection yet sent by Mr. DuChaillu.

32. *BERNICORNIS ALBOCRISTATUS*, (Cassin.)

Buceros albocristatus, Cassin, Proc. Acad. Philada.

Buceros macrorhynchus, Bonap. Cons. Av. p. 91, (1850.)

Jour. Acad. Philada Quarto, i. pl. 15.

The present collection contains the second specimen that I have ever seen of this remarkable species. This specimen is apparently not in so mature plumage as that originally described by me, and has the feathers on the cheeks behind and below the eye mixed with white and black, instead of pure white as in the former specimen. The greater wing coverts and all the quills are tipped with white.

33. *BUCEROS POENSIS*, Fraser.

Buceros poensis, Fraser, Proc. Zool. Soc., London, 1853.

Described by Mr. Fraser as above, from a female specimen, and apparently the same bird which was labelled as the female of *Buceros elatus*, Temm. in a collection from Western Africa received from Dr. Robt. MacDowell at this Academy some years since, as stated by me in the Proceedings of this Academy.

If this is the female of that species, it is more unlike the male than is the case in any other with which I am acquainted. A single specimen, which is labelled as a female, is in the present collection.

34. *ALCEDO LEUCOGASTRA*, Fraser.

Alcedo leucogastra, Fraser, Proc. Zool. Soc., London, 1841, p. 4.

Fraser, Zool. Typ. Birds, pl. 32.

35. *HALCYON SENEGALENSIS*, (Linnæus.)

Alcedo senegalensis, Linn. Syst. Nat. i. p. 180, (1766.)

Swains. Zool. Ill. pl. 27.

36. *HALCYON BADIA*, Verreaux.

Halcyon badia, Verr. Rev. et Mag. de Zool. 1851, p. 264.

Precisely similar to the specimen described by Mr. Verreaux which is in the Museum of the Academy.

37. *MEROPS VARIEGATUS*, Vieillot.

Merops variegatus, Vieill. Ency. Meth. p. 390.

Merops cyanipectus, Verreaux, Rev. et Mag. de Zool. 1854, p. 269.

Le Vaill. Guepiers, pl. 7.

Received in every collection.

38. *MEROPISCUS MÜLLERI*, nobis.

Rather larger than *M. gularis*. Bill long, curved, culmen distinct, wing mode-1857.]

rate, third and fourth quills longest and nearly equal; tail rather long, even or slightly rounded; feet weak.

Total length about 8 inches, wing $3\frac{1}{2}$, tail $3\frac{1}{2}$ inches.

Throat with a few feathers of bright scarlet. Head above and entire under parts fine blue, lighter and inclining to green in front and over the eyes. Back and wings chestnut. Tail above blue, darker than that of the under parts of the body, with the inner webs of the outer feathers black, beneath black. Auricular feathers bluish black, under wing coverts pale rufous chestnut. Bill and feet dark.

Hab. Muni River, Western Africa. Discovered by Mr. P. B. DuChaillu.

One specimen only of this curious and very handsome species is in the collection. It is a true *Meropiscus*, and though but little larger than *M. gularis*, and strictly of the same form, does not resemble it in colors.

As a slight testimony to his accomplishments as a naturalist and enterprize as a scientific traveller, this handsome bird is dedicated to my friend, the Baron John William Von Müller of Württemberg, distinguished for his Zoological Researches in North Eastern and Central Africa.

39. *CYPSELUS AMBROSIACUS*, (Gmelin.)

Hirundo ambrosiaca, Gm. Syst. Nat. ii. p. 1051.

Cypselus parvus, Licht. Verz. p. 58.

Temm. Pl. Col. 460, fig. 2.

40. *ATTICORA NITENS*, nobis.

Tail nearly square, not forked, and but slightly emarginate, the tips of the feathers slightly produced or mucronate. Bill short, rather wide at base, weak; wing long, the first quill longest with its outer edge having reversed serrations rough to the touch; tail rather long. Quills wide, primaries somewhat curved.

Total length about $4\frac{1}{2}$ inches, wing $3\frac{1}{2}$, tail $2\frac{1}{2}$ inches.

Throat fuliginous. Entire other plumage greenish black with a tinge of brown on the back and darkest on the abdomen and under tail coverts, and in the whole plumage having a green metallic lustre. Quills and tail black, edged with glossy dark green. Bill and feet dark.

Hab. Muni River, Western Africa. Discovered by Mr. P. B. DuChaillu.

I have in this collection four specimens of this species, labelled as both sexes, and can refer them to no description given in the books. This species appears to resemble *Hirundo obscura*, Temm. Cabanis' Jour. 1855, p. 355, but has no such character as "*cauda profunde furcata*." On the contrary, the tail is quite square or truncate and but slightly emarginate.

41. *APALODERMA NARINA*, (Vieillot.)

Trogon narina, Vieill.

Le Vaill. Ois. d'Af. pl. 228, 229; Gould, Monogr. pl. 26.

The first instance of the occurrence of this well known species in Western Africa. One very fine specimen is in the present collection, and is precisely identical with numerous others now before me from the Cape of Good Hope.

42. *ZANCLOSTOMUS FLAVIROSTRIS*, Swainson.

Zanclostomus flavirostris, Sw. B. of W. Af. ii. p. 183, pl. 19.

43. *DENDROBATES*, Swainson.

There are in the collection, two species which I cannot at present determine. There are also specimens of one species of Woodpecker not belonging to this genus. Numerous specimens of species of this family being now in the possession of the Academy I propose at an early period to make them the object of special study.

44. *NECTARINIA SUPERBA*, (Vieillot.)

Certhia superba, Vieill.

Vieill. Ois. Dor. pl. 22.

Really a *superb* species, apparently not uncommon in Equatorial Africa.

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45. *NECTARINIA CYANOCEPHALA*, (Vieillot.)
Certhia cyanocephala, Vieill.
Vieill. Ois. Dor. pl. 7, 25.
46. *NECTARINIA STANGERII*, Jardine.
Nectarinia Stangerii, Jard. Ann. Nat. Hist. x. p. 187.
Jard. & Selby, Ill. Orn. U. S. pl. 48.
47. *NECTARINIA CHLOROPYGIA*, Jardine.
Nectarinia chloropygia, Ann. Nat. Hist. x. p. 188.
Jard. & Selby, Ill. Orn. N. S. pl. 50.
48. *NECTARINIA OBSCURA*, Jardine.
Nectarinia obscura, Jard. Nat. Lib. Orn. xiii. p. 253, (1842.)
Jard. & Selby, Ill. Orn. N. S. pl. 51.
Two specimens in the present collection labelled as males appear to be this species. They are, however, evidently in immature plumage.
49. *PERISTERA CHALCOSPILUS*, (Wagler.)
Columba chalcospilos, Wagler.
Rüpp. Syst. Uebers. pl. 38.
50. *PERISTERA PUELLA*, Schlegel.
Peristera puella, Schleg. Beydr. Dierk. i. p. 19, pl. 6, (1848.)
51. *PERISTERA TYMPANISTRIA*, (Temminck.)
Columba tympanistria, Temm.
Le Vaill. Ois. d'Af. pl. 272; Knip. et Prev. Pigeons, ii. pl. 36.
Not to be distinguished from specimens from Southern Africa.
52. *SQUATAROLA HELVETICA*, (Linnæus.)
Tringa helvetica, Linn. Syst. Nat. i. p. 250, (1766.)
Wilson, Am. Orn. vii. pl. 59; Gould, B. of Eur. iv. pl. 290.
Not distinguishable from the bird of the coasts of America and Europe. Specimens in the present collection are from the mouth of the Muni and Corisco island.
53. *CHARADRIUS ZONATUS*, Swainson.
Charadrius zonatus, Sw. B. of W. Af. ii. p. 135, pl. 25.
Very similar to the European and American *C. minor*. Specimens from Corisco island.
54. *SCOPUS UMBRETTA*, Gmelin.
Scopus umbretta, Gm. Syst. Nat. i. p. 618.
Ardea fusca, Forst. Desc. An.
Cepphus scopus, Wagler, Syst. Av. p. 146.
Buff. Pl. Enl. 796.
From the mouth of the Muni.
55. *HARPIPRION OLIVACEUS*, (Dubus.)
Ibis olivacea, Dubus, Mem. Acad. Brussels, 1837, p. 103.
Dubus, Esq. Orn. i. pl. 3.
A young specimen, but evidently of this species, and the first that I have ever seen. General colors as figured by the Baron Dubus, but with the feathers of the neck and breast having central large spots of dark fulvous, with which also a few of the feathers of the crest are striped longitudinally.
56. *TOTANUS HYPOLEUCUS*, (Linnæus.)
Tringa hypoleuca, Linn. Syst. Nat. i. p. 250.
Gould, B. of Eur. iv. pl. 316.
From Corisco Island.
57. *CALIDRIS ARENARIA*, (Gmelin.)
Tringa arenaria, Gm. Syst. Nat. i. p. 680.
Wilson, Am. Orn. vii. pl. 59; Gould, B. of Eur. iv. pl. 335.
From Corisco Island.

58. *STREPSILAS INTERPRAS*, (Linnæus.)
Tringa interpras, Linn. Syst. Nat. i. p. 148.
 Wilson, Am. Orn. vii. pl. 57; Gould, B. of Eur. iv. pl. 318.
 Precisely similar to specimens from the coast of New Jersey.
 From Corisco Island.
59. *NUMENIUS PHÆOPUS*, (Linnæus.)
Scolopax phæopus, Linn. Syst. Nat. i. p. 243.
 Gould, B. of Eur. iv. pl. 303.
 From Corisco Bay, mouth of the Muni.
60. *PODICA SENEGALENSIS*, (Vieillot.)
Heliornis senegalensis, Vieill. Nouv. Dict. xiv. p. 277.
 Lath. Gen. Hist. x. pl. 164; Gray, Gen. iii. pl. 172.
61. *STERNA SENEGALENSIS*, Swainson.
Sterna senegalensis, Swains. B. of W. Af. ii. p. 250.
 Scarcely different from the European, *Sterna hirundo*. A single specimen
 from the island of Corisco, mouth of the Muni.

On the Crania of the Ancient Britons, with Remarks on the People themselves.

BY JOSEPH BARNARD DAVIS.

It was the distinguished and excellent Professor Samuel George Morton, who, by his industry, skill and great attainments, mainly developed what may be denominated the science of Comparative Cranioscopy, as applied to ancient and extinct races of men. And we deem it an especial honor to be permitted to address that learned body before which Morton's chief discoveries in this science were first announced—an Academy which had the surpassing advantage of numbering him among its Presidents. But in venturing thus to address the Academy of Natural Sciences of Philadelphia upon a subject congenial to those so admirably illustrated by its late President, and therefore in some measure following in his steps, it must be distinctly announced *in limine*, that it is not with any pretensions whatever to co-equal powers, or co-equal learning.

The Ancient Britons, the aboriginal people of the British Isles, are a race of whose physical characters we can learn little or nothing from classical writers, whether Greek or Roman. The very little knowledge to be acquired is only incidental, never direct—imparted as it were by accident. They were a people divided into a number of tribes, living chiefly by the chase and the products of the rivers and the sea; yet not devoid of both pastoral and agricultural habits. They are known to us mainly from presenting a serious obstacle for ages to the arms of the conquerors of the world—imperfectly subdued with much difficulty, and only held in subjection by the most consummate stratagems of the military art of the Romans. To account for their first appearance in the Islands, many ingenious and learned theories of immigration have been broached, all of which are exposed to a serious objection, independent of failing to suggest any reasonable motive for such primordial migration, viz: that they are based upon a point, instead of a broad and solid foundation—they invert the order of nature, and make use of the result and the superstructure to give the substratum which is required. They all suppose man, in his most primitive and most helpless condition, to have been endowed and furnished with appliances and arts, which are only the result of development and cultivation. And, like the similar fanciful speculations which would derive the Indian tribes of the American continent from the eastern one, are obnoxious to the objection of being gratuitous and superfluous. Their inventors can give no valid reason, based on solid ethnological ground, why the assumed migrations may not have pursued a diametrically opposite course. This being the case, we have a right to maintain, that there is a decided preponderance on either one side or the other, and an equal reason to assume for the primitive inhabitants of the British Islands an aboriginal and primordial character not inferior to that of any other race.

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Like most, if not all the primitive people, they have manifested the great principle inherent in the human mind, which incessantly animates an irrepressibly longing hope and aspiration for a future life—one of those elements of man, which more than any other bears irresistible evidence, both of his inherent grandeur and superiority in the animal scale, and also, of the strict unity and identity of his race—they have manifested this noble and sacred sentiment by a scrupulous and elaborate care in preserving the dead; to whom they even furnished food, objects of adornment, weapons and companions also for the future life they anticipated beyond the tomb. Their tombs, the Cromlechs, Barrows, Cairns of the British Islands, notwithstanding the lapse of twenty, thirty or more centuries, have remained until recent times scattered over the surface of the country in various directions; and, it is evident, have been constructed with such pains and skill as to have braved all the chances and changes of revolving ages, until the arts of modern agriculture, or the inquisitive hand of man—alas! almost constantly a rude, uninstructed and ruthless hand—have unheard the remains they have so faithfully preserved.

These remains, which, as Sir Thomas Browne long since said, "have quietly rested under the drums and trappings of three conquests," are capable of teaching us something of the race to which they have belonged, and of recalling some of those physical features of which it is so unfortunate the ancients left no full, faithful and permanent record, when they had the living people before them. If we might not have expected from the martial spirit of Cæsar an ethnography of the tribes who proved such stubborn obstacles to his ambition and desire of conquest, there were those among his friends, who passed over and remained with him in Britain, who had both the abilities and the opportunities to accomplish this task. The most illustrious of Roman orators, as we learn from his invaluable Epistles, writing to his brother Quintus, who was one of Cæsar's companions in Britain, and even entertained the design, urges upon him the composition of the work which we must ever lament the want of—a Poem on the geography, the natural history, the ethnography—"mores et gentes," the nations or tribes, and their manners and customs—as well as the history of the war in which the great Roman general had been engaged with them. It were in vain to lament the want of the curious information this work would have imparted. We are now mainly reduced to the teachings of the tomb, and in the language of M. L'Abbé Cochet, a learned French archæologist, "dans le silence de l'histoire, le tombeau est le meilleur document que l'on puisse consulter pour connaître la vie, les mœurs, et la religion de nos pères."

The eleven fine lithographs of the skulls of the ancient Britons, which I transmit to the Academy with this paper, have been executed from the crania themselves of the *natural size*, and with the greatest care and fidelity. They are derived from Barrows in parts of England at considerable distances from each other,—some from Yorkshire, which was inhabited by the tribe of the *Brigantes* in the time of Ptolemy, about the year 120 of the Christian era,—some from Derbyshire and Staffordshire, the seats of the *Coritani* and *Cornavii* at the same period,—one from Gloucestershire, the seat of the *Dobuni*,—and others from Wiltshire, the country of the *Atrebatii* in the days of Ptolemy. We cannot affirm that they have actually belonged to individuals of these tribes respectively, as there are many chances which might render this doubtful. Wars, whether intestine or foreign, and migrations, no doubt did their work of mutation in that early time as they have done since; and there is also the possibility, although very remote, of their having belonged to prisoners, or to guests of neighboring or remote tribes. But in the absence of all evidence to support these suppositions, we cannot err much in appropriating them to the tribes in whose country they were found. At least, there can be no question of their genuine *Britannic* origin and derivation. This, as we shall perceive on closer examination is impressed on every feature, and is now almost as cognizable as in the day in which they were clothed with their fleshly lineaments.

The study of skulls in general teaches us that among all races, although there is a general resemblance running through the series belonging to a given race, 1857.]

yet there are many minor diversities; and it is probable that among European races these diversities have a wider range than in the other great divisions of the human family. Morton was able to discern among all the numerous American races, exclusive of his hyperborean, a family resemblance. Notwithstanding this position of his, we must admit that the diversities of the cranial forms of the very numerous and diverse tribes of the American continent are both great and frequent; and an extended study would in all probability develop such resemblances in specific families as would confer upon them a distinct and proper value. Now among such specific families belonging to European races we believe it is much the same, only that the individual peculiarities in the families diverge further from the tribal type of form, and are probably more frequent. Under these circumstances, we are prepared to expect diversity of form among the crania of the ancient Britons; but it is not unreasonable also to expect that, true to the beautiful principle of nature, of an endless diversity under a comprehensive uniformity, this diversity will be restrained within limits, and be subjected to definite rules. We may therefore endeavor to distinguish what may be denominated the typical form of cranium belonging to any race of man, and then to arrange the divergent forms subordinatedly around this.

I. We believe the typical form of cranium of the ancient Briton may be regarded as represented by some of the skulls delineated in these lithographs, especially in that from the Barrow on Ballidon Moor in Derbyshire, and that from Green Gate Hill Barrow in Yorkshire, and that from Codford in Wiltshire, plates 1, 3, 4 of the 1st decade of *Crania Britannica*. They are somewhat short or *brachy-cephalic*, not ill-developed, nor remarkable for a small facial angle. The bones of the face, and especially the upper maxillaries, are upright, or *orthognathous*, but, also rather short; and they present, more than the bones of the calvarium that rugged aspect which is the characteristic of a savage or semi-civilized race. The chin is usually prominent, the external surface of the upper maxillaries depressed, the nose abrupt and short, surmounted with a frowning eminence marking the situation of the frontal sinuses. The teeth are tolerably large and usually well worn. They correspond with the rugged and frequently everted angle of the lower jaw, the spacious zygomatic arch, and the large surface, well marked out by its superior semi-circular line on the sides of the calvarium. These rough and spacious surfaces indicate power in the temporal and masseter muscles, and equally with the condition of the teeth, reveal a people of carnivorous tastes, a people whose delight was in the chase, and the luscious feasts it afforded them.

II. Of the aberrant forms of the ancient British skull one is remarkable for its length, and may be denominated *dolicho-cephalic*. To this form there attaches a good deal of interest, from the theories which learned men have been induced to associate with it. An example of this peculiar aberration is afforded by the cranium from the famous chambered Barrow of Uleybury in Gloucestershire, plate 5 of *Cran. Brit.* This skull is remarkable for its length and want of elevation, but it is not particularly distinguished by narrowness. Other examples of the dolicho-cephalic form of the ancient British cranium are known to the writer, but some of these are quite as much marked by their want of breadth as by their elongation. In fact, they equal in this feature the skulls of that race to which longness and narrowness of cranium are regarded as peculiarly appropriated—the negroes of Africa. It is a singular circumstance that these long skulls of ancient Britons have usually been met with in a particular species of Barrow, that which is composed of a series of chambers, arranged it may be in diverse manners—the chambered Barrow. In the anxious inquiries in which the mind is apt to indulge when prying into the almost impenetrable obscurity of a very remote past, every special circumstance fixes the attention and acquires importance. And the discoveries we have mentioned have led to the theory that these long crania have belonged to a particular precedent race of people, a people who interred their dead in a more elaborate and complex manner than the race which succeeded them; a race of people which have been distinguished by the denomination of *pre-Celtic*. In the

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opinion of the writer the evidence is much too incomplete for any such inference as this, were it not equally obnoxious to the objection mentioned in the early part of our remarks—that of a certain inversion in the order of sequence—by representing the complex barrow builders as preceding those who raised simple barrows, which is contrary to all experience. There are good archaeological reasons, it is true, for believing that the chambered Barrows of Great Britain belong to what is denominated “the stone period,” and that they are very early, but that the builders of them can with any good confidence be referred to the earliest portion of the stone period, seems to us to want probability as much as it wants conclusive evidence for its support. The circumstance that these long skulls have usually been found in chambered Barrows may be a mere contingency, little more than accidental, and further inquiry may not improbably prove this. For it must not be supposed that the skulls of ancient Britons are numerous, or have often been saved from the wreck of their primeval sepulchres, and especially that many of the dolicho-cephalic crania from Barrows of a chambered character have been met with. Strangers to the facts of the case might have supposed both these things to be true, but indeed they are far from being so. Specimens of crania of ancient Britons are rare objects, those in anything like a perfect state, very rare, and all specimens are becoming rarer every day. British Barrows have been undergoing destruction for ages, having been the prey of idle curiosity or cupidity always, and the skulls of those once so sacredly enshrined in them by the tender hands of mourning friends and relations have always been especially exposed to destruction, possibly from the feeling of ignorant terror, which is so apt to diverge into ferocity and destructiveness. But whatever be the cause, the fact receives daily confirmation that when ancient tombs are accidentally opened by uninstructed and unscientific persons, the relics are plundered and the fragile bony remains are at once violently broken into fragments. Therefore objects such as those with which our attention is occupied are not numerous, and have not received that notice to which they are entitled. But to return to the dolicho-cephalic crania of the chambered Barrows, supposed to indicate a “pre-Celtic race,” and upon which has chiefly been built the mighty doctrine—certainly mighty for such a meagre foundation—that an entire race of a distinct people, in some very remote period of antiquity, migrated to the shores of the British islands and invaded them, established themselves therein and dwelt there for ages. In some cases the evidence for this vast hypothesis—countenanced by ethnologists of the greatest learning, men well meriting the high reputation they enjoy—may be explained in a much simpler way. In a Derbyshire Barrow, called Long Lowe, three crania of this type occurred, which we are strongly inclined to regard as having a family relation, and as exhibiting a mere family peculiarity. One a long flat skull of beautiful outline, is that of a man, aged about 40 years; another, that of a woman somewhat older; and the third, of a girl under 10 years of age, who may be concluded to have been the daughter of the two above named parents. Another of the Derbyshire chambered Barrows, which has been productive of dolicho-cephalic crania, is situated upon “Five Wells Hill,” and is unquestionably of vast antiquity; but we possess a skull from among the lowest interments in this Barrow, which is of brachy-cephalic form, and the existence of which, in the position in which it was found, we cannot help thinking shakes the theory of the dolicho-cephalic pre-Celtic race to its very foundations. In fine, we may remark, that we see no sufficient ground for admitting a favorite hypothesis of the present day, that another race of people preceded the ancient Britons; which kind of doctrine has not been confined to the British isles, but took its rise in Denmark and Norway, where it has received its chief attention and illustration, although it should be mentioned, that the order of precedence has been inverted there, and the brachy-cephalic, not the dolicho-cephalic people, have been supposed to have come first.

III. The next important aberrant form is one that is remarkable for horizontal expansion, and which we have denominated *platy-cephalic*. The cranium is not deficient in longitude, but does not impress the eye by its length on ac-
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count of being equally expanded in breadth. It forms a skull of considerable capacity, and is well exhibited in the cranium from the Western Hill Barrow, No. 6, although not very apparent in the lithograph of the profile.

IV. These are the chief aberrant forms. It is probable there may be another distinguished by the extreme elevation of the vertex, to which the name of *acro-cephalic* is applicable. It is not unlikely that the skull from the Barrow at Kennet, near the famous avenue and megalithic circle of Avebury in Wiltshire, in the lithograph No. 9, is an instance. Its extraordinary facial form we fear is partly to be attributed to some distortion arising from an imperfect restoration from the fragments to which it was reduced when found.

From the remarks now made, it will be seen that our investigations are far from giving countenance to a doctrine, announced by a very respectable authority, that in primeval times the skulls of mankind were much more alike than in the present day, that they were, as it may be said, "stereotyped" in one mould. So far from this we believe it may be proved in this field, as in all others, that diversity within certain definite limits has been the beautiful law of nature from the first.

In *stature* we have reason to know the ancient Britons varied a good deal. A famous skeleton of a British chieftain, discovered in a coffin made out of the trunk of a tree, in 1834, at Gristhorpe, near Scarborough, and now preserved in the Museum of that town, measured 6 feet 2 inches in height. Another skeleton, also from the North Riding of Yorkshire, in the rich Museum of British antiquities of Mr. Bateman, of Youlgrave, in Derbyshire, measures only 5 feet 3 inches in height. Whilst that of a British woman in the same Museum, from a Derbyshire Barrow called "Wagon Lowe," near Buxton, measures 5 feet 5½ inches in height.

No one has labored so earnestly, so diligently, and with so much pains and care as the late Professor Morton to bring the test of the measurement of crania of various races to the elucidation of different obscure problems of anthropological science. It becomes us, therefore, to explain what little information we have been able to collect upon this subject. At present it is but little, still in the course of another year or two we trust to make it much more complete. In bringing our present imperfect evidence before the Academy, we hope to be excused for remarking, that we are not inclined to expect quite so much or quite such conclusive information from the determination of the capacities of crania as Morton did. And we are satisfied that a much more extended observation, upon a more defined basis than he adopted, is requisite to develop data of a reliable character as to the relative capacities of different series of skulls. One great source of error will require to be eliminated, arising from taking any series of crania above a certain age, provided they are not idiots, *indiscriminately, and without regard to the relative numbers of the different sexes*. For instance, from the remarkable and well known difference in the size of the skulls of men and of women of the same race, if we have an equal number of crania of two races to compare together, the one series containing a greater number of those of women than the other, the whole calculation will be vitiated. But without dwelling further upon these questions at present, we will give, in a tabular form, the internal capacities of a few ancient British crania, merely explaining that they are all those of men, and are taken with dry sand by weight. In order, however, to render them as far as possible available for comparison with Morton's great table laid before the Academy in the year 1849, and published in the "Proceedings" for that year, we have converted them into the denomination of cubic inches employed by him, and arranged the figures exactly as he did.

Number of Ancient British skulls of men 11.

Largest internal capacity.....	110.15 cubic inches.
Smallest do.	87.7 "
Mean do.	98.6 "

These results do not admit a strict comparison with the table of Morton, on the ground already stated, that the British skulls have belonged to men exclusively. Still we shall be safe in comparing Morton's largest internal capacity

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with ours of 110.15 cubic inches, for, no doubt, both were derived from the skulls of men. The largest internal capacity in his whole table, 114 cubic inches, was found in the skull of a Dutchman, who was born at Utrecht and died in Java. In fact, it is the largest cranium in the grand Mortonian collection. A skull of an ancient Briton found in Green Lowe, in Derbyshire, which has probably belonged to a Coritanian, has a capacity of 110.15 cubic inches, or within 4 cubic inches of the same size. The largest of Morton's *English* skulls had an internal capacity of 106 cubic inches, or 5.15 cubic inches less than the Green Lowe Barrow cranium. And the largest of Morton's *Anglo-American* skulls was no less than 13 cubic inches less than this from the Green Lowe Barrow in internal capacity. From this small and imperfect amount of evidence we appear to be justified in concluding that the crania of the Ancient Britons were by no means deficient in internal or cerebral capacity. Much more numerous observations are, however, required before any data can be deduced on this subject, of a nature as satisfactory as the evidence will admit.

It may not be impertinent to mention here, parenthetically, that the skull of largest internal capacity we have met with, is an ancient *Irish* calvarium, found in 1855 at a depth of 10 feet in Suffolk street in Dublin; of course the term ancient in this place must be taken conditionally, as applying probably to mediæval and not to primeval times. The internal capacity of this calvarium is not less than 123.5 cubic inches, or very nearly 10 cubic inches more than that of the Dutchman of noble birth in the Mortonian Collection.

An assertion is frequently made by the advocates of the progressive development and improvement of all races, which it may not be improper to allude to here. They maintain that the influence of what is denominated civilization is able to develop the brain of any race materially in the course of ages, and consequently its osseous case. This doctrine of development is distinct from that which affirms that different races of men are distinguished by crania of different capacities; on the contrary, it supposes that all races may, by a process of civilization and development attain to a large capacity of the skull and corresponding great brain. As far as the observations of ancient British crania we have previously mentioned, they do not give any countenance to this theory of development. And, we may add, that our further observations, although neither so numerous nor so extensive as they ought to be, and as we hope to make them, on ancient Roman and on Anglo-Saxon skulls, are equally far from rendering this doctrine support. Of the hitherto few skulls already engraved in the "*Crania Britannica*," we may refer to one ancient Roman skull derived from the city of York, the Roman "*Eboracum*." The internal capacity of this cranium amounts to no less than 104.7 cubic inches. Another fine cranium of an Anglo-Saxon derived from an ancient cemetery in Cambridgeshire, has an internal capacity of no less than 109.6 cubic inches. As far, therefore, as these data go, they give no countenance to the assumption that, as races proceed in their advancement from the state of barbarism upwards, their brains gradually expand. With the capability of all races to make this advance, another assumption that is usually associated with the former, we have nothing to do at present.

It would be quite unnecessary to remark upon the permanency of cranial forms before an Academy presided over by Morton, any more than to dwell upon primitive diversity, which has already been alluded to. But the series of skulls to which the attention of the Academy has been solicited, afford additional evidence which bears upon these points. And an attentive consideration of ancient skulls will develop a series of remarkable diversities.

Professor Morton, in his elaborate and well-reasoned work, "*Crania Egyptica*," which stands in so near a relationship to this Academy, has pointed out in the most masterly manner the characteristics of the cranium of the ancient Egyptians. That delicate cranial form was proper to them, whom Morton ultimately concluded to be indigenous to the valley of the Nile, and strictly aboriginal. It was we, believe, deserving of the epithet *idiogeneous*, or especially proper to the race, and had a relation to them alone, and to no other race, ancient or modern. There is a peculiarity in the generality of the mummified 1857.]

heads of the ancient Egyptians, well seen in the skulls also, which Morton has not expressly mentioned, but which always strikes us at the first glance. Like all ocular impressions, it is more readily perceived than described. But it arises from the particular outlines by which the profile of the cranium is circumscribed. The *base line*, the most essential feature, runs along the whole of the base of the lower jaw from the tip of the pointed chin, and passing thence directly to and along all the external centre of the occipital bone as far as its tuberosity. This base line may be seen to be totally at variance with the line which bounds the ancient British skull in the same direction from the profiles before the Academy. We believe it is only found in crania of an African lineage, and in none so level and uniform as in those of the ancient Egyptians. If we let down upon this base a facial line, which shall run along the forehead, and, with only a slight deviation, till it runs also along the fore part of the pointed chin, we thus bound the cranium in these two directions by right lines, which meet at a more acute angle than in any other race. They are strictly Egyptian in their character, for in the negro races this facial line has no proper commencement from the receding forehead, and is seriously interrupted by the prognathous jaws and teeth. It is the form we have thus endeavored to analyse and describe which imparts to the ancient Egyptian skull its delicate and elegant character.

How diverse is the robust erect form of the ancient British skull, marked by great depressions of the facial surface, and instead of the graceful long nasal bones, abrupt and short ones, standing immediately below the frowning frontal protuberance, with the intervening hiatus. All which features impress the mind with feelings of a much less complacent kind, and inevitably lead to the conviction that we have before us the representation of a bold uncivilized nature—full of power, and not deficient in capacity, but quite incapable of refinement and the graces of cultivation. These Egyptian and British cranial forms are strikingly at variance, although probably owning an equal antiquity—indeed we see no good reason whatever, why these different people may not have been primeval contemporaries; and yet the marks of diversity they present are as clear and sharp as any that can be adduced among any modern people. They point, therefore, in an irresistible manner to a primordial difference.

The ancient Britons themselves, it is probable, may be regarded as an *idigenous race*, i. e., taken as a whole proper in their characters, physical and moral, and distinct from all others. Whether the ancient Gauls resembled them in all particulars, seems very doubtful. They admit of comparison with other people of ancient and modern times, but we are inclined to think, were we able to realize a faithful and complete picture of them, it would present irreconcilable discrepancies with other races. They had many marks of agreement with the Indian Tribes of North America. They dwelt in a temperate region, where animal and vegetable life was abundant, and devoted themselves to the chase, in which they were assisted by the aboriginal hounds of Britain. Claudian, in his allusion to these dogs, represents them as capable of overcoming bulls.

. hæ pedibus celeres: hæ nare sagaces.
Hirsutæque fremunt Cressæ, tenuesque Lacœnæ,
Magnaue taurorum fracturæ colla Britannæ.

The Britons were equally possessed of the small indigenous horse of the country. They also found in the native forests animals of chase of equal, nay greater, magnitude than that of the Buffalo of the prairie, and, we have reason to think, were as successful as the Indians of the northern part of this continent in their pursuit of them. A Barrow opened in the parish of Cherhill near Calne in Wiltshire, in 1833, revealed a number of bones, and among them were the enormous horns of an ox, the *horn-cores* of which had a circumference of 15½ inches at the root, and in their widest expansion, a diameter of 33 inches. Besides this colossal ox they had other bovine cattle, and deer, of the hunting of which with hounds the Romano-British pottery affords numerous pictures, as it seems to have been a favorite subject with the artists for the Samian ware. It appears at first view an astonishing circumstance that the weapons of chase,

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the arms and implements of the ancient Britons should be almost identical with those of the ancient race of Indians of this continent. The same spear-heads, arrow-heads, axes, &c., of the earlier North American Indians are of the same forms as those of the ancient Britains, and they differ only in material. Instead of the constantly occurring flint of the Britons, the North American tribes have used flint more sparingly, and a series of other hard and beautiful stones, such as chalcedony, jasper, crystal, &c., for the production of these weapons. To the kindness of Mr. Franklin Peale, a highly esteemed Member of this Academy, the writer is indebted for a very fine collection of the stone implements and weapons of the North American Indians, which excited surprise to find them so closely approximating to those of the ancient Britons. The truth is the resemblance now alluded to seems to be confined by no limits of latitude or longitude. The stone weapons and implements from Japan in Siebold's Museum at Leyden we found to be scarcely distinguishable from the British; and we have also seen flint spear-heads from New Zealand, not only closely approximating the ancient British ones, but actually fashioned with the same number of strokes, given in the self same direction.

In accordance with the prevailing views on the origin and distribution of man, this extraordinary similarity in the stone weapons and other utensils of such widely distributed races has been ascribed to the distribution of the makers, and the communication of the art. An hypothesis, we believe, out of the limits of possibility by any natural means of diffusion. Whereas, the simple circumstance that these weapons are all produced by beings of similar powers and capacities, having similar wants, and similar objects wherewith to satisfy those wants, is an adequate explanation of the phenomenon; and according to all right principles of philosophy should be admitted at once.

That the ancient Britons adopted the flexed or crouching posture in the interment of the dead, just as the Indian races of America, we have abundant evidence. This again is a practice generally diffused among all uncivilized races, the aborigines of Australia adopting it, as well as others. There need be no question also, that it is to be referred to some common cause operating on all alike; very probably to a desire to imitate that posture which is both easy and agreeable to them, in the hut or around the fire, and associated in their minds with the most pleasing recollections of life; therefore fittest in which to renew life, and to begin again the social intercourse and delights of another world beyond the tomb. For it should never be forgotten that savages, as we call them, are not brutes, but richly endowed with all the sentiments of the human mind, and animated by its highest aspirations.

How far the ancient Britons advanced in that general development which we call civilization, it is difficult to ascertain. That the more southern tribes, especially, received from the Phœnician traders, implements and weapons of bronze, and learned the art of manufacturing such themselves, is now pretty satisfactorily determined; although it is very questionable whether these superseded the earlier stone ones wholly anywhere, but especially in the remote districts of the country. Their fate was by a succession of imperial armies to be kept in check, to be subjected to a succession of conquests, and ultimately to be in large part reduced to slavery, whether in their native regions, or in Italy and in the other dependencies of the empire. Those who can lay claim by descent to the nearest relation to the aborigines of the British Islands are still a peculiar people, marked in every feature of their characters by traits which distinguish them from the races of other blood with whom they have been for so many ages in contact. Thus proving that the lineaments of nature cannot be effaced by all the chances and changes of time.

We have now gone over the subject proposed to be discussed—perhaps in a somewhat too long and discursive manner, with a view of rendering it more easy to be understood by those to whom it is probably not very familiar—as far as it seems desirable at the present time. And it only remains for the writer to express his appreciation of the mark of honor conferred upon him by this learned Academy in allowing him to address them, and more especially in per-
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mitting him to do so in the character of a Corresponding Member. However inadequate to make a due return for such a distinction, it will always be his pleasure and his ambition to place his poor attainments at the service of the Academy.

Notice of a collection of Reptiles from the Gaboon country, West Africa, recently presented to the Academy of Natural Sciences of Philadelphia, by Dr. Henry A. Ford.

BY EDWARD HALLOWELL, M. D.

Ord. SAURII.

Fam. GECKONES.

HEMIDACTYLUS ANGULATUS, Hallowell. Proc. Acad. N. S., vol. vi. p. 63. Six specimens.

Fam. LACERTIANS.

(Sub-fam. Autosaures cælodontes, D. & B.)

TACHYDROMUS FORDII, nob.

Char. A small plate between the fronto-nasal; back with six complete carinae and two incomplete; abdomen strongly carinated; femoral pores oblong, oval, numerous; color bronze above with metallic reflections, greenish below.

Description. Nostril in a single plate, the naso-rostral; immediately behind it a small plate, the naso-frenal; two frenals, an anterior and posterior, the latter much the larger of the two; one freno-orbital on the right side, two on the left; that on the right oblong, quadrilateral; rostral broad, pentangular, in contact with the naso-rostral; internasal large, in contact posteriorly with the fronto-nasal and the small intermediate plate between them; laterally with the naso-rostral and the first frenal; the frontal plate is long, hexagonal, slightly excavated at its sides; the supra-orbital consists of two plates as in *Lacerta*; there are two fronto-parietals, two large parietals, an inter-parietal somewhat urceolate in shape, and a small occipital; six plates margin the upper jaw, the fifth, which is beneath the eye, by far the largest; four plates on each side of the jaw beneath the infra-labials, the three first quadrangular, the last less distinctly so, but much larger than the others; auricular openings oval; no palatine teeth; posterior maxillary teeth tricuspid, the anterior conical; tongue slender, bifid in front, chevronée; body slender, covered with large hexagonal plates upon the back, each with a carina running along the middle, constituting six longitudinal complete rows; besides these there are two others, which terminate about half way down the body. Upon the abdomen six rows of plates strongly carinated; flanks covered with small plates; extremities strongly carinated; fourth finger and toe the longest; from 11 to 13 oblong femoral pores on each side; tail very long, verticillate, strongly carinated both above and below. A large scale in front of the anus with two small ones externally.

Coloration. Head black above; sides bluish, body bronze with metallic reflections; tail and extremities bronze above; throat, abdomen, under part of extremities and tail greenish, mingled with yellow.

Dimensions. Length of head 6 lines; greatest breadth 3; length of neck and body to vent 1 inch 5 lines; tail 2 inch 11 lines; (mutilated) of arm 3; of forearm 3; of head to extremity of longest finger 4 lines, of thigh 4 lines; of leg 4; of sole to extremity of longest toe 6.

Habitat. Gaboon contry, W. Africa, one specimen in Mus. Acad. presented by Dr. Henry A. Ford.

Gen. Remarks. This is the first time that the genus *Tachydromus* has been recognized to exist on the African continent, *sexlineatus* being found in China, Cochin China and Java; and *Japonicus* in Japan. This genus is also found in [Feb.

the Loo Choo islands. The African genus differs in no respect from the Asiatic, except in the presence of the small plate imbedded between the inter-nasal and frontal and the two fronto-nasals.

Fam. *CHALCIDIANS* or *CYCLOSAURIANS*.

(Sub-fam. *Ptychopleuri*.)

There are two specimens of *Gerrhosaurus* in the collection of Dr. Ford, one much smaller than the other and probably the young. The larger one resembles in its coloration *Gerrhosaurus Bibronii*, of S. Africa, but the measurements differ both from those of that species and of *typicus*.

	Inches.	Lines.
Length from nose to base of tail.....	3	6
Of tail.....	7	9
From nose to meatus externus.....		9
From nose to base of anterior extremities.....	1	4
Distance between fore and hinder extremities.....	2	

These dimensions more nearly correspond with those of *flavicularis*, but in that there are *ten* rows of ventral scutes.

G. validus is a much larger species, and *sepiiformis* and *subtessellatus* do not in the least resemble it, (vide Smith, Illustrations of the Zoology of S. Africa.) We therefore consider these two specimens as belonging to a new and undescribed species, with the following characters:—

GERRHOSAURUS NIGRO-LINEATUS.

Char. Eight rows of ventral scutes; six superior labials; body slender; tail long, two yellowish vittæ, one on each side of the back, commencing at the occiput and lost upon the tail; within each vitta a black band running the whole length of the back; the interspace marked with black spots assuming more or less the form of longitudinal lines well marked upon the tail; flanks, in the young white spotted, under parts yellowish.

Description. The body is slender, covered above and upon the sides with twenty-five longitudinal rows of carinated scales; the interspace between these and the ventral scutes occupied with six rows of granulations; tail long and tapering, cyclo-tetragonal at base; the rostral plate presents an acute angle above, and articulates on either side with the first labial and the naso-rostral; the nostril opens between three plates, the naso-rostral, the naso-frenal and the first labial; the naso-rostral are well developed, in contact, with a convex anterior margin, the internal quite short, the posterior concave, where they articulate with the inter-nasal; the naso-frenal are in contact inferiorly with the first supra-labial, above with the inter-nasal; the inter-nasal is a large plate, more extended laterally than longitudinally, its inferior and lateral margin in contact with the first frenal; the fronto-nasals are two in number and in contact; the frontal is hexagonal, longer than broad, more narrow posteriorly, its lateral margins excavated; there are two fronto-parietals, a little larger than the fronto-nasals, and like them pentagonal; there are two large parietals, with a small inter-parietal, broader anteriorly; the second frenal is much larger than the first; there are two small freno-orbitars, the first longer than the second; there are four supra-orbitars, with a longitudinal row of as many plates beneath them, and there are six supra-labials; the posterior genaeals are considerably larger than the anterior; the mental is broader than long; there are eight longitudinal rows of quadrangular ventral scutes, more or less striated, and fourteen anal pores on each side; the preanal scales are five in number, the lateral ones the most developed; scales upon outer surface of thighs, legs and forearms strongly carinated; there are thirteen transverse rows of scales between the occiput and the anterior extremity; the total number between the occiput and the posterior extremity fifty-one; one hundred and eleven verticillæ upon the tail; auricular opening triangular, with a large scale in front; eight scales upon right temple, nine on left, in three rows, the posterior of the middle row the largest.

Coloration. Head olive colored above, spotted with black; two yellow stripes, one on each side of the back commencing at the occiput, and lost nearly midway upon the tail, bordered with a band of black internally; interspace olive, black spotted, having the appearance of lines upon the tail; extremities olive colored above, posterior part of thighs yellow spotted; abdomen cœrulean blue; the remainder of the under surface yellowish. *Young* white spotted upon the sides upon a bluish ground, and a double row of white spots along the back between the black colored bands; sides of tail white or yellow spotted.

Dimensions. Length of head 10 lines; greatest breadth 6; of head and body to vent 2 inch. 10 lines. Total length including tail 11 inch. 5 lines.

Habitat. Gaboon. Two specimens, adult and young.

(Sub-fam. Cyclosaures glyptodermes, D. & B.)

PHRACTOGONUS GALEATUS, nob.

Proceed. Acad. N. S., vol. vi. p. 62. The length of this specimen is 1 ft. 2½ inches; of tail 1 inch 4 lines. A very singular looking animal. The contrast between the narrow mosaic looking quadrangular scutes upon the back, and the two longitudinal rows of broader ones is quite striking; the tail is short and rounded at its posterior extremity, which is protected by a circular mamelonated shield. The figure of the plate in the wood-cut of the nostrils in the volume of the Proceedings referred to, does not appear to be accurate, this plate being more extended longitudinally, reaching to the extreme end of the rostral, where it is quite narrow terminating almost in a point. The single lateral pore on each side of the preanal scutes is very distinct and is no doubt a constant character. This species appears to be allied to the *Cephalopeltis Cuvierii* of Müller, which has two plates upon the top of the head, (*Zeitschrift für Physiologie*, von F. Tiedemann, G. R. & L. C. Treviranus, Vierter Band. Erstes Heft. 1831, Taf. xxii, fig. 5, a, b, c. Dr. Smith in speaking of *Monopeltis capensis* observes, that although I have put forward this species as a type of the group, I doubt if its more extended observation will justify the proceeding. It may prove to be only a very aberrant species of *Lepidosternon*, and if so *Cephalopeltis Cuvieri*, Müller, will be a species of the same group, only a degree less removed from the typical form. The most marked difference between the species in question and *Lepidosternon macrocephalum*, Wagl., consists in the covering of the head; in the latter it is formed of many plates, in *Cephalopeltis* of two only, and in *Monopeltis* of one. (Illustrations of S. African Zoology, Reptiles, pl. xvii.)

Fam. SCINCOIDIANS.

EUPREPES BLANDINGII, nob.

Proc. Acad. N. S., vol. ii. p. 58. Six specimens, (four adult,) (one immature,) (one quite young.)

In a specimen from Liberia, the white stripe extends about half way along the side of the body, but it is more extended on the opposite side, and in all the specimens from the Gaboon there are two white vittæ on each side, the lower one commencing in front of the eye and terminating at the posterior extremity; the upper one beginning at the occiput and reaching as far as the root of the tail, the lower band the broader of the two; four narrow black lines along the back, two on each side, becoming lost upon the root of the tail where they assume more the form of spots; the row of white spots passing along the side of the neck and body as far as the extremity of the tail mentioned in the former description, is no doubt identical with the upper lateral vitta; under surface immaculate. I do not observe that the inter-parietal is larger than either of the fronto-parietals in any of the specimens; in the one from Liberia it is longer. In all the Gaboon specimens the fronto-nasal are separate; in the one from Liberia they are almost in contact.

EUPREPES FRENATUS, nob.

Sp. Char. Fronto-nasals in contact; frenals remarkable for their great de-
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velopment, especially the second frenal; scales upon back broader than in *Blandingii*; color olive above, black spotted without any distinct dorsal or lateral vittæ; abdomen greenish with a tinge of yellow, immaculate; the green much more marked upon the sides; 33 rows of scales, tricarinate upon back and sides; total length 5 inch. 4 lines; from extremity of snout to anterior extremity 1 inch; between anterior and posterior extremities 1 inch 4 lines; of tail 3 inches; (renewed) of anterior extremity to extremity of longest finger 10 lines; of posterior to extremity of longest toe 1 inch 1 line.

Habitat. Liberia. One specimen presented by Dr. William Blanding, perhaps a variety of *Blandingii*.

EUPREPES ALBILABRIS, nob.

Char. Supero-nasals not contiguous, inter-nasal much broader than long, fronto-nasals in contact, more extended laterally than longitudinally; fronto-parietal very narrow anteriorly; scales 3-keeled; color olive, black spotted, a black irregular band passing from behind the eye along the sides, margined inferiorly with white; upper lip white; under parts bluish mingled with green upon the abdomen; chin yellowish.

Description. This specimen is much smaller than any of those of *Blandingii*, and differs from them all, even the young, in a marked manner, both in the shape of the cephalic plates and in the coloration. The rostral plate presents nothing remarkable, the supero-nasals are narrow, situated obliquely, a short distance apart; the inter-nasal is hexagonal, much broader than long, with an obtuse angle posteriorly, its lateral margins quite short; the fronto-nasal are closely in contact (separate in *Blandingii*), and are shorter and more extended transversely than in the latter species; the frontal is quite narrow posteriorly, presenting an obtuse angle in front; the fronto-parietal differ much in appearance from those of *Blandingii*, their anterior extremities being very narrow and their lateral margin longer; the inter-parietal is quite slender posteriorly, with a moderately acute angle posteriorly; there are eight supra-labials, the sixth long and quadrangular (fifth in *Blandingii*), and situated immediately beneath the eye; twelve transverse rows upon the back counting from one white lateral margin to that on the opposite side.

Coloration. Bronze or olive above, with irregular black spots; a black band from posterior margin of orbit, broad and well defined upon temples, more narrow upon sides where it appears to be lost near the middle, with an irregular margin superiorly, bordered with white inferiorly; upper lips white; under parts bluish mingled with green upon the abdomen; chin with a tinge of orange.

Dimensions. Length of head 9 lines; greatest breadth 3; length from head to vent $13\frac{1}{2}$ lines; between anterior and posterior extremities $8\frac{1}{2}$; from snout, to anterior extremity $6\frac{1}{2}$; arm 2 lines; forearm 2; palm to tip of longest finger 3; of thigh $2\frac{1}{2}$; of leg 2; of sole to extremity of longest finger, $4\frac{1}{2}$ lines, (tail mutilated.)

Habitat. Gaboon. One individual presented by Ford.

A single specimen of a Scincoid described in Vol. VI. of the Proceedings of the Academy, p. 64, under the name *Acontias elegans*, but much larger, and which evidently belongs to a genus distinct from *Acontias*. This specimen measures 8 inches and 8 lines in extent, the tail 2 inches 10 lines, circumference 1 inch 3 lines. There are twenty-two transverse rows of scales, and one hundred and seventy-three longitudinal, including fifty-six upon the tail; there are no eyelids, but the eye may be distinguished situated near the middle of a scale at its anterior margin. The Typhline of Cuvier, from the Cape of Good Hope, the only species of Typhline described by Duméril and Bibron and by Mr. Gray, is represented by the former to be without other cephalic plates than that which encloses the whole face, as in a sort of case, (etui.) Mr. Gray, however, mentions 1857].

an internasal, a frontal, an interparietal and two parietals, but in both descriptions the preanal scale is represented as single.

The scales upon the head, as given by Mr. Gray, are very different from those of the genus under consideration, the characters of which approach nearest perhaps to those of *Feylinia*, Gray, Cat. Lizards of British Museum, p. 129, in which the preanal scales are numerous. *Feylinia* is characterized as having a moderate rostral, no eyes, with scales in front of the vent like those of the belly, and a tapering tail, a description which does not represent our animal. The scales upon the back appear to be somewhat larger than those upon the sides; those upon the abdomen and under part of tail are very finely striated, upon the back also, but the striations are less distinct.

Should no generic name have been previously given to this Scincoid, we would propose that of *Sphenorhina*.

SPHENORHINA ELEGANS, nob.

Syn. *Acontias elegans*, Hallowell, Proceed. A. N. S. vol. vi., p. 616.

Char. Head rather small, depressed; snout enclosed in a single scale; nostrils lateral, with a semicircular slit reaching to the posterior margin of the rostral; three large plates upon the top of the head in a longitudinal line; the first, which is heptagonal, situated immediately behind two small plates posterior to the rostral; the second regularly hexagonal; the third presenting three distinct margins in front, the posterior margin rounded; eyes concealed by a scale, but quite visible; body cylindrical, somewhat depressed, covered with twenty-two transverse and one hundred and seventy-three longitudinal rows of smooth scales, including fifty-six upon the tail; the latter of moderate length, of nearly equal thickness throughout, except at the posterior extremity, where it is conical; four scales in front of the anus, smaller than those which cover the rest of the body. Total length 9 inches 7 lines; tail $2\frac{1}{4}$ inches; circumference 13 lines.

Habitat. Gaboon. Two specimens in Mus. Acad. N. S. presented by Dr. H. Ford.

Order OPHIDI.

Fam. *SYNCRATERIANS*. (Innocui.)

LEPTOPHIS SMARAGDINUS, Duméril et Bibron.

Syn. *Dendrophis smaragdina*, Boie. MS. Schlegel, Essai sur la Physiognomie des Serpens, La Haye, 1837, p. 237, Id. Traill's Translation, p. 156, 1843.

Ab. scut. 158; a double preanal; sub-caud. 135, in Duméril and Bibron's specimen 154; 15 rows of carinated scales; sides of abdomen very angular. Total length 2 feet 6 lines; of tail 9 inches 4 lines.

One specimen, Gaboon; presented by Dr. H. A. Ford.

Gen. Remarks. *Dendrophis* Chenonil, Reinhardt, appears to be a different serpent; the anterior frontals in the figure of that species (Reinhardt, nye Slangenarter, fig. 13.)* are quite small; in *L. smaragdinus* their internal margin is much larger than that of the posterior, the reverse is the case in *D. Chenonil*. *L. smaragdinus* is now one of the best determined species first described in print, and very accurately, by Prof. Schlegel.

Among the specimens sent by Dr. Ford is an arboricole serpent, having a general resemblance to *Leptophis smaragdinus*, but which, on a careful examination, differs so much in its characters from those of *Leptophis*, that we do not hesitate to make it a distinct genus, and for the following reasons: The head is more robust and not so long, the anterior frontals are smaller comparatively, the vertical is shorter, as are also the occipitals; indeed, all the plates upon the

* Beskrivelse Af Nogle nye Slangenarter ved J. Th. Reinhardt. Kjøbenhavn. Trykt I. Bianco Lunos Bogtrykkeri. 1843.

top of the head, although having a general resemblance, differ in fact from the corresponding plates of *smaragdinus*; the nostril, instead of being between two nasal plates, (the naso-rostral and naso-frenal,) is situated between the naso-rostral and the frenal, which, however, may be accidental; the frenal plate is considerably less narrow; the eyes, instead of being oval, as in *smaragdinus*, are round or subround, and much more prominent; the temporal plates are five in number, in two longitudinal rows, three in the inferior and two above; in *smaragdinus* there are four, two below and two above; in another, younger specimen, four on one side, three on the other, but differently arranged; the number of superior labials is the same in each, viz., nine, the fifth and sixth immediately beneath the eye; but the shape of these plates differs in the two animals, no two being alike; the posterior and superior angle of the sixth in *smaragdinus* is much more prolonged upward and backward, and the seventh is much larger; the middle labial and the accessory labials differ in form, but the difference most to be remarked is between the posterior genials, which in *smaragdinus* are very long and comparatively slender; the scales in the one snake are long, narrow, and strongly carinated, in the other perfectly smooth, much less narrow and quadrangular, and there is a difference of three and a half inches in the length of the tail. It may be interesting to compare this serpent with *Herpetodryas æstivus* and *Dryophylax viridissimus*, two slender green serpents, the one from Surinam, the other from the United States. *Herpetodryas æstivus* and *Chlorophis heterodermus* are of nearly the same length, there being a difference of about 7 lines; but the difference between the tails is greater, that of *æstivus* being, in the specimen examined, 1 inch $8\frac{1}{2}$ lines longer; but how marked is the difference in the shape of the frontal plate; the nostrils in *Herpetodryas* open in a single plate, and although in both there are but one preocular and two postoculars, they are altogether different in form; in the one the eye rests upon the fifth and sixth supra-labials, in the other (*Herpetodryas*) upon the fourth and fifth. The arrangement and number of the temporal plates is different; in *Dryophylax*, which is a much stouter and longer serpent, the frontal plate differs from either of the others, the prefrontals pass down upon the side of the head as far as the supra-labials, the pre- and postoculars, although the same in number, still differ in shape, the position of the nostril is different, being between two plates, the eye rests on the fourth and fifth supra-labial plates, and the size of the eye differs, being smallest in *Herpetodryas*, largest in *Chlorophis*. If we compare the supra-labials in the three we shall find them each of a peculiar type; in *Dryophylax* the sixth and seventh being remarkable for their large size. The scales upon the body are also different. If we examine the teeth comparatively, we shall find that in *Chlorophis* the maxillaries, which are smooth, present a marked curvature anteriorly, the points inclining backward, the three posterior longer than the other, the two last more especially, which are also much more robust; neither of the posterior teeth appear to be grooved. In *Herpetodryas* the teeth are smooth and resemble each other, (*Aglyphodontes isodontiensis*, D. and B.) In *Dryophylax* the posterior maxillary teeth are longer and channelled, (*Opisthogyphedipsadion*, D. and B.) *Dryophylax* is a South American genus, exclusively, so far as is known, but *Herpetodryas*, according to Duméril and Bibron, exists not only in America, but in Madagascar and the Isle of France. The following are the generic characters of *Chlorophis*:

Maxillary teeth recurved, the posterior ones less than the anterior, the three last larger than the others, the two hinder ones especially, which are not channelled; nostrils between anterior nasal, and frenal; frenal remarkable for its large size; one antocular, two postoculars; nine superior labials, the eye resting on the 5th and 6th, and a very small part of the fourth; three anterior supra-labials small, the three posterior large; rostral rather high; two internasals and two prefrontals, vertical, pentagonal, much broader anteriorly, longer than broad, excavated laterally, presenting an acute angle behind; occipitals pentagonal, well developed; supra-oculars not projecting; eyes round and quite prominent; scales smooth, in 15 rows, quadrangular, about twice as long as broad anteriorly, broader posteriorly, the inferior row the largest; a single pre-1857.]

anal scute; tail slender and tapering to a point, of moderate length, not half the length of neck and body.

CHLOROPHIS HETERODERMUS, nob.

Sp. Char. Color green; 15 rows of scales, many of the scales marked with white, more especially upon their external border, sometimes both the internal and external. Total length 1 foot 9½ inches; abdom. sc. 157, sub-caud. 83.

Dimensions. Length of head 7 lines; breadth 4; of tail 5 inches 9 lines.

Habitat. Gaboon. One specimen presented by Dr. Henry A. Ford.

Gen. Remarks. We at first supposed that this serpent might be identical with the *Dendrophis Chenonii*, Reinhardt, from Guinea, but the nasal in that species is between two nasal plates, and according to Duméril and Bibron, the preanal scute is double. They also state that were it not for the difference in the teeth, they would consider it a true *Dendrophis*; now *Dendrophis* has a much larger row of scales along the middle line of the back, which *Chlorophis* has not. Duméril and Bibron also mention that in *Leptophis Chenonii* there are 154 urostega—M. Reinhardt, 108—126.

Fam. *LYCODONTIANS.*

Among the serpents in the collection of Dr. Ford, are three different genera of Lycodontians, three of different ages belonging to the genus *Boedon*, and two of undescribed genera. We propose to give an account of them, and also a *Boedon* presented some time ago by Dr. Burtt, U. S. Navy, from the Isle de Los.

The family of Lycodontians is characterized by Duméril and Bibron as "serpents with smooth teeth, or unchanneled, always unequal, the anterior longer than those which follow, distributed in numerous series upon the jaws, and without vacant spaces between them. Body cylindrical; head larger behind than the neck," the essential characters being the existence of smooth teeth (*Aglyphodonta*) "of unequal force and length in both jaws." *Erpet. Gen. tom. vii. p. 357.* The Lycodontians are divided into four tribes: 1, *Boédonians*; 2, *Lycodontians*; 3, *Eugnathians*; 4, *Pareasians*. In the *Boédonians* the palatine teeth are unequal, the submaxillary teeth separated; *those above not separated.* In the *Lycodontians* these teeth are *distinct, isolated*; the anterior pterygo-palatine teeth not longer than those which follow; the submaxillary teeth unequal. In the *Eugnathians* the submaxillary teeth are not separated by a free space, the pterygo-palatine equal; and in the *Pareasians*, as in the *Eugnathians*, the mandibular teeth are much longer in front than those which succeed them, but in the former the anterior pterygo-palatine teeth are much longer.

The essential characters of the sub-genus *Boédon*, belonging to the first tribe *Boédonians*, and the family *Lycodontians*, the ninth of the *Aglyphodont Ophidians*, in Duméril and Bibron's arrangement, consist in having "the four or five superior maxillary teeth longer by half than those which follow, and which are nearly equal among themselves and regularly spaced; then a free interval; the four or five first palatine teeth longer; the five first inferior maxillaries longer and more curved."

BOEDON QUADRIVITTATUS, nob.

Char. Two white vittæ bordered with fuscous on each side of the head, the inferior commencing behind the eye and extending as far as the angle of the jaw, the superior passing over the eye and upon the temple, expanded inwardly upon the occiput, forming two large white irregular blotches, one on each side, uniting with its fellow on the opposite side, upon the internasals and prefrontals, posteriorly extending about 1½ inch upon the neck, where it is lost. Body and tail uniformly brown above, white beneath with dark colored maculations. 27 rows of scales; a single preanal scute. Total length 2 feet 8¾ inches.

Description. The head is of moderate size, depressed, covered above with nine plates; the internasals are considerably smaller than the prefrontals; the latter are in contact laterally and inferiorly with the frenal, posteriorly with the frontal, and by their postero-external margin, which is incurvated with the

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superior antocular; the frontal is long, presenting a nearly straight margin anteriorly, its sides scarcely incurvated, its posterior angle acute, passing a considerable distance beyond the supra-oculars; the supra-oculars are five-sided; they do not project over the eye; the nostrils are between two plates, their superior margin in contact with the internasal, the posterior margin of the second with the frenal, its postero-superior with the prefrontals; the frenal is oblong, more or less quadrilateral, or rather pentangular, about twice as long as broad; there is one large antocular of singular shape, five-sided, larger above, the surface by which it is in contact with the prefrontal, convex, the postero-superior by which it is in contact with the supra-ocular and the frontal concave, as well as the anterior and posterior margins; there are two post-oculars, the first somewhat quadrangular in shape, the inferior five-sided; the rostral is broader than high, its latero-superior margins excavated, with an acute angle above, its inferior margin also excavated, its lateral margins rounded; there are eight supra-labials, no two of them are precisely alike in shape; the second is higher than the first, and is quite narrow above; the third is quite large, four-sided, about as broad as long, the fourth smaller than the third, the fifth five-sided, the eye resting upon the upper margin of the fourth and fifth, which are excavated to receive it; the sixth also pentangular, but higher than the fifth; the seventh also pentangular, but in a different manner, and broader than the last; the eighth also pentangular, but broader than either the sixth or the seventh, with a more obtuse angle above, and its summit lower than that of either of the two last mentioned plates; the middle labial is long, having an acute angle posteriorly, broad in front; the accessory labials are also long, and pointed behind, the anterior genaeals longer and more developed than the posterior; there are seven inferior labials; two parallel rows of large plates upon the temples; superior maxillary teeth of nearly equal size and moderately curved, except the five anterior, which are longer, more robust, and more strongly incurvated; anterior inferior maxillary teeth longer than the others; palatine and pterygoid teeth in two long rows, not straight, but slightly curved anteriorly, presenting an ovoid interspace posteriorly; tongue enclosed in a sheath, with two slender pointed filaments in front; neck not so thick as posterior part of head; body moderately robust, becoming more slender toward the tail, which is of moderate length and tapering, but not pointed at its extremity; the flanks present no remarkable angularity; the scales are smooth, lanceolate and narrow anteriorly, broader posteriorly; there are 27 rows at the middle of the body, 25 near the neck, 20 near the tail, upon which there are from 6 to 15 rows.

Abdom. scut. 235; 1 single preanal; 58 sub-caud. urostega, which are in a double row.

Coloration. Uniformly brown above upon the neck, body and tail, with two vittæ on each side of the head, as above described; chin, throat and neck white; abdomen and under part of tail white, with dark colored maculæ.

Dimensions. Length of head 1 inch; greatest breadth 7 lines; length of body 2 feet 2 inches 10 lines; length of tail $4\frac{1}{2}$ inches. Total length 2 feet 8 inches 7 lines; circumference 1 inch $10\frac{1}{2}$ lines.

Habitat. Isle de Los. One specimen presented by Dr. Burt, U. S. N.

We have in the collection of Dr. Ford three specimens of a serpent formerly described in the Proceedings under the name *Cælopeltis virgata*, but which is a species of *Boedon*, and although allied to the species above described, differs from it in the following particulars: The largest of the specimens is considerably smaller than *quadrivittatum*; the head is shorter and more obtuse anteriorly; the temples more protuberant; the frontal is more narrow anteriorly, less acute posteriorly; the superior labials resemble those of *quadrivittatum* sufficiently, but there is a difference in the form of the frenal and antocular plate; there is also but a single row of temporals, with a single large one situated between the parietal and the three plates constituting this row; 1857.]

the shape of the scales does not differ materially, but the number is less, there being but 23 rows near the middle of the body, from four to 11 rows upon the tail. The two lateral stripes on each side of the head are of a yellow color and more narrow, and meet at the rostral, the interspace forming an acute angle, whereas in *quadrivittatum* they meet upon the internasal and prefrontals, displaying a quadrangular interspace.

BOJEDON QUADRIVIRGATUM, nob.

Syn. *Caelopeltis virgata*, Proceed. A. N. S. Vol. vii. (1854) p. 98.

Sp. Char. Head short and thick, more narrow in younger specimens; snout obtuse; frontal plate of moderate breadth (anteriorly, posterior angle somewhat obtuse; 23 rows of scales; two narrow yellow lines on each side of the head, the superior commencing at the rostral, passing over the eye and upon the temple, extending about three lines upon the side of the neck; the inferior commencing at the middle of the posterior margin of the orbit, passing obliquely over the inferior post-ocular, the three last superior labials, and crossing the angle of the mouth, extends in an oblique manner a distance of three lines, and terminates at the line of junction between the neck and throat, at a distance of two lines from the superior lateral stripe.

Color uniformly brown above; neck and abdomen yellow; beneath, in the middle, the external portions of the gastrostega brown; the intermediate space spotted with brown; under part of tail brown.

Total length 2 feet 2 inches.

Abd. scut. 205; sub-caud. 45.

Description. The scales are somewhat broader than in the last described species; in the younger specimens the head is more narrow, the temples less projecting, upon which are observed two rows of temporal plates. In each of these specimens there are but 23 rows of scales. In one the internasal and prefrontals are fused together. Gastrostega 202; a single preanal; urostega 47, in 2d 190—55.

Dimensions. Length of head 9 lines; greatest breadth 6; length of neck and body 1 foot 11 inches 3 lines; of tail 3 inches 4 lines.

Habitat. Gaboon, west coast of Africa. Four specimens in Mus. Acad. N. S., presented by Dr. Henry A. Ford.

Sub-Fam. Eugnathians.

The first of the two serpents about to be described, belonging to the sub-family or tribe Eugnathians, presents a series of remarkable characters such as belong to no serpent with which we are acquainted, and which constitute a genus to which the name *Hormonotus* may be applied.

HORMONOTUS,* nob.

Gen. Char. Head Lycodontiform; the temples swollen; the snout rounded; the eyes prominent, looking upward and outward; internasals considerably smaller than prefrontals; vertical long, pentangular; nostril between two plates; a frenal; one antocular, three postoculars; the eye resting on the fourth and fifth supra-labial; two of the anterior teeth of the lower jaw quite large, the posterior stouter at the base, and longer than the anterior; two long anterior teeth in the upper jaw preceded by several small ones, followed by an interspace without teeth, and eight or more maxillaries of nearly equal length; palatine and pterygoid teeth in two long rows, presenting an ovoid space posteriorly; scales smooth, with a larger hexagonal row along the median line of the back; tail of moderate length, tapering to a point, with double urostega; ventral scutes passing up along the sides in a nearly rectangular manner.

HORMONOTUS AUDAX.

Sp. Char. Uniform light brown or reddish as above, yellow beneath; 15 rows of smooth scales.

* *ὄζυος*, a chain, and *νότος*, back.

Description. The head is depressed; the snout rounded; the temples swollen; the nostrils, which are large, are situated in a depression between two plates; the eyes prominent, latero-superior, circular, the pupil ovoid, perpendicular; the rostral plate is pentangular, much more broad than high; the internasals are of moderate size, the prefrontals of much greater dimensions, their external and inferior border in contact with the frenal, their posterior with the antocular, the supra-ocular and the frontal plates; the supra-ocular are pentangular, much more narrow anteriorly; the frontal is five-sided, its lateral margins scarcely excavated, its posterior angle moderately obtuse, two and a quarter lines in length by about one and a half in breadth; the parietals are three lines in length by two in breadth, much more narrow posteriorly; the frenal is rather long and of moderate breadth, in contact inferiorly with the second and third supra-labials; the antocular is larger than either of the three postoculars, and is pentangular in shape; there are two rows of temporal plates, surmounted by a third, of which the posterior is the largest; there are nine superior labials, the eye resting on the fourth and fifth; no two are precisely alike, the first is the smallest, the seventh pentangular, a line in breadth by half a line in height; there are seven inferior labials, each differing more or less in shape, and of which the fourth is of much greater dimensions than either of the others; the mental is triangular, the accessory labials rather long, the first genaeal much larger than the second. The *neck* is much more narrow than the head, is rather long and slender; the body of very moderate thickness; the tail one-fifth of the total length. There are 15 to 17 rows of smooth scales near the middle of the body, 18 upon the neck, 12 near base of tail; the scales are short and quadrangular upon the middle, more narrow upon the neck, broad upon the tail; the scales constituting the dorsal row are considerably larger than the adjoining rows, and each scale is hexagonal in shape; this larger row extends upon the tail, but in the specimen examined appears to be interrupted near its root. Ab. scut. 221; 1 single preanal; 81 bifid sub-caud.

Dimensions. Length of head 9 lines; greatest breadth $5\frac{1}{2}$; length of body 1 foot 8 inches 7 lines; length of tail 5 inches. Total length 2 feet 2 inches 4 lines.

Habitat. Gaboon, west coast of Africa.

Gen. Remarks. The outline of the head and the general arrangement of the plates, has a certain resemblance to the figure of *Lycodon audax* (*Lycognathus scolopax*, D. and B.) in the atlas accompanying the *Physiognomie des Serpens* of Prof. Schlegel, pl. iv. fig. 18, but it is quite a different serpent from the latter, which is found in South America. It has also a certain relation, in the general disposition of the plates upon the head and teeth, with *Lycognathus cucullatus*, a North African serpent, but a comparison of the two proves at once that they belong to different genera. The outline of the head, the relative proportions of the internasals and prefrontals, and the form of the frontal plate, are very different; the nostrils are deeply excavated in *Hormonotus*; in *cucullatus* there is no larger dorsal row, and the scales are shorter, &c. It is also a much smaller animal.

The species which remains to be described is a quite different looking serpent from the last, presenting a series of generic characters quite remarkable, more especially the form of the frontal plate.

Gen. Char. Head cuneiform, eyes small, two small inter-nasals, two large prefrontals, a frontal about as broad as long, presenting an acute angle posteriorly; nostril in a single plate at its posterior margin, two nasals, a frenal, one antocular, two postoculars, seven superior labials, the eye resting on the third and fourth; several small teeth on the upper jaw, followed by a much larger one, after which an interspace, succeeded by a row of small and nearly equal teeth; maxillaries of lower jaw presenting a corresponding system of dentition; but the interspace behind the larger teeth do not exist apparently; body nearly the same thickness as head; tail short; scutes bifid.

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LYCOPHIDIUM LATERALE, nob.

Sp. Char. Uniformly reddish brown above and olive below, with the exception of two lateral yellow vittæ on each side of the head, the one reaching to the angle of the jaw, the other to the posterior margin of the occiput; 17 rows of smooth scales.

Description. Head cuneiform, flat above, shelving forward, the plates exhibiting the appearance of a polished surface; snout rounded; rostral plate much broader than high, with an obtuse angle at its summit; the inter-nasals are quite small compared with the pre-frontals, their external margins in contact with the nasal and the first frenal; the pre-frontals are quite large presenting an acute angle externally, where they are in contact with the first and second frenal and the antocular; the frontal is short and broad, its posterior angle acute, its anterior and external corners bevelled, the intermediate space undulating; it measures nearly a line and a half in length, by one and a quarter in breadth; the supra-oculars are quite short, about one-half their usual length, broader posteriorly; the posterior half of their external margin in contact with the superior post-ocular; the parietals are large, much longer than broad, in contact anteriorly with the supra-ocular; the first post-ocular, and by a very small facet at their anterior and external angle, with the second posterior ocular; there is one frenal plate, longer than broad, with an acute angle posteriorly; it is in contact above with the pre-frontal; it presents a somewhat obtuse angle, and two surfaces inferiorly, the anterior in contact with the first supra-labial, the posterior with the second; its anterior and superior border is much broader than its posterior, which is externally narrow; the antocular is a remarkably large plate, more narrow above, in contact inferiorly with the second and third supra-nasal, above by an oblique facet with the frontal, anteriorly by a convex margin with the pre-frontal, posteriorly with the eye, and the anterior border of the supra-ocular plate; there are two post-oculars, the inferior the larger of the two; there are eight superior labials, no two precisely alike, the first the smallest, the sixth, which is pentagonal, the largest, the eye resting on the third and fourth; the third is separated from the anterior margin of the orbit; the fourth supra-labial and the antocular intervening; the nasal plate is somewhat quadrangular in shape, the nostril being situated in its posterior half, its posterior border in contact with the anterior border of the naso-frenal, which presents an oblique facet without any sinuation whatever; the plates upon the top of the head are all highly polished; the eye is small, the pupil ovoid, rather than round; there are two rows of temporal plates, three in the inferior, two in the row above, and a large quadrangular plate between these and the parietals; immediately behind the parietals, are two smaller plates than the latter, with a still smaller one between them; the mental and accessory labials present nothing remarkable; the anterior genieals are quite broad, larger than the posterior, which are much more narrow; four small teeth precede the larger one in the upper jaw, then follows an interspace succeeded by nine or more small teeth of nearly equal size; anterior to the large tooth in the lower jaw are also several smaller ones, succeeded by a row of nine or more small teeth, the anterior a little the largest on the left side, but not in the right; the palatine teeth are in two long rows, and present an ovoid space posteriorly; the neck is of nearly the same thickness as the head behind, the body thicker, the tail short and robust, rapidly tapering to a point; the scales are smooth and shining, those upon the neck more narrow, those upon the body broader, with rounded posterior angles; the inferior row perhaps a little the largest; there are 15 rows upon the neck, 17 upon the middle of the body, 8 near the root of the tail; the scales upon the tail appear to be irregular, about three lines from the vent they are homogeneous, but posterior to this space may be observed two parallel rows of hexagonal scales broader than the others, succeeded by smaller ones, and then a single row of four narrow and quite broad hexagonal plates; the gastrostega are narrow, the sides of the abdomen not angular.

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Coloration. The neck, body and tail are brown above, inferior parts brown with a tinge of olive, presenting a shining and a polished appearance, especially the ventral and sub-caudal scutes; a yellow vitta on each side of the head meeting upon the muzzle, and extending as far as the extremity of the occiput; a more narrow one extending from the posterior margin of the eye to the angle of the mouth.

Dimensions. Length of head 6 lines; greatest breadth $3\frac{1}{2}$; length of neck and body 1 ft.; of tail 1 inch $11\frac{1}{2}$ lines.

Abdom. scuta 176, a single preanal, 44 sub-bifid-caudal.

Habitat. Gaboon country, one specimen presented by Dr. Henry A. Ford.

Gen. Remarks. The serpent above described belongs apparently to the genus *Lycophidion* of Fitzinger, but does not correspond in all respects with the admirable description of the Eugnathians by Duméril and Bibron, particularly in the size of the eyes, which they represent as "tres grands", and the form of the abdomen which is described in the species observed by them as flat, in our specimen being much rounded.* In other respects there appears to be a perfect coincidence. But two species are enumerated by them both from South Africa, viz: *L. Horstcockii* and *L. semicinctum*; the first is white beneath, the second is brown, but has a series of reddish bands across the back; both want the lateral yellow vittæ of *L. laterale*.

Sub-Order *Opistoglyphs*, (venenosi.)

OXYBELIS KIRTLANDII.

Syn. *Leptophis Kirtlandii*, nob., Proceed. A. N. S. vol. ii. 1844, p. 62. *Dryophilis Kirtlandii*, Id. Proceed. Acad. N. S. vol. vii. 1854, p. 100; *Oxybelis Lecontei*; Duméril et Bibron, vol. vii. p. 821. These specimens measure 4 ft. 2 inches in length, tail 1 ft. 7 inch. 10 lines. I find 19 rows of scales near the middle, 17 upon the neck, 6 near the root of the tail; the nostril is large and ovoid in a single nasal plate; there are two frenal plates in both specimens on each side of the head, the posterior in the one being much larger than the corresponding one in the other, the anterior more narrow than the anterior one of the other in the same side; on the right side in one they are narrow and oblong, in the other the anterior is much smaller than the posterior; one antocular, two post-oculars on the right side, three on the left in one; in the other three posterior on the right, three on the left; eight superior labials; the eye resting on the fourth and fifth in both specimens; posterior genaeals quite long; the scales are long and slender, the inferior row the largest; the tail at its extremity almost filiform; the plates upon the top of the head, though not corresponding precisely in the cut, have the same general proportions; 170 gastrostega, a double preanal, 166 urostega, 175 in another, urostega 168.

Gen. Remarks. The description of this "Arboricole opistoglyph" by Duméril and Bibron is very characteristic of its specific relations, and extremely accurate, but they are in error in stating that it had never before been described, the first account of it having been given by us in the second vol. of the Proceedings of the Academy, 1844, p. 62, a fact for which I am indebted to Prof. Aug. Duméril himself, but who had not previously seen the animal.

The collection of Dr. Ford contains a fine specimen of *Dipsas Blandingii*, Hall., Proceed. Acad. N. S. vol. ii. p. 170, and vol. vii. p. 100. It is, however, not a *Dipsas*, and we propose for it the generic name *Toxicodryas*. This remarkable Arboricole serpent measures 5 ft. 7 inch. (Fr.) in length, tail 1 ft. 4 inch.; 22 rows of scales may be counted at the middle of the body exclusive of the large hexagonal dorsal row, 17 rows more posteriorly. The former description char-

* We had proposed for this serpent the generic name *Lissophis*, but have not well authenticated specimens of *Lycophidion* to compare with it; future observation must determine whether the former or latter name shall be retained. 1857.]

acterizes the external form of the serpent sufficiently well, but it may be added that the supra-labials are for the most part bordered with black, and that 25 large blotches may be counted on each side of the body; upper part of neck of same color as occiput, probably green during life. There is but a single channelled posterior tooth on each side in these specimens, and therefore they cannot belong to the genus *Triglophodon* of Dum. and Bibron, which has three; the posterior genials are longer than the anterior, but of about equal breadth.

TOXICODRYAS, nob.

Gen. Char. A single tooth channelled anteriorly in the posterior part of the upper jaw, much longer than the others, and more robust; the other superior maxillary teeth smooth, of nearly equal length, well developed, and equally spaced but wide apart, the two anterior somewhat shorter; five or six in number; pterygo palatine teeth well developed, the anterior the longest; three anterior teeth in the lower jaw longer than the others, and stouter, the three posterior the smallest, the three intermediate ones smaller than the three anterior, but larger than the three posterior; unequally spaced; head covered above with nine plates; a rostral broader than long, two broad inter-nasals, smaller considerably than the pre-frontals; a frontal of moderate length, but broader anteriorly; supra-oculars remarkable for their great breadth posteriorly; parietals of moderate size; nostrils large, lateral, between two plates; a quadrangular frenal; two anterior and two posterior oculars; two rows of plates between the parietals and supra-labials; eye resting on the fourth, fifth and sixth of the latter; body very long and much compressed; scales long, narrow and quadrangular; a dorsal row much larger, hexagonal; abdominal scutes extending upon the flanks; sides of abdomen angular; tail long with bifid scutes.

TOXICODRYAS BLANDINGII, nob.

Syn. Dipsas Blandingii, vol. ii. p. 170—vol. vii. p. 100.

Sp. Char. 17 to 22 rows of scales; color greenish olive above; three black spots upon the head; one at the internal and posterior angle of the supra-ocular, the other near the internal and posterior margin of the parietals; supra-labials bordered posteriorly with black, one of these spots broader than the rest, reaching up nearly to the eye; body greenish olive above, with 25 large dark colored alternate blotches on either side; upper part of tail marked in a similar manner; chin, throat, abdomen and under part of tail yellow; ab. scut. 274, 1 bifid preanal; sub-caudal 137; circumference 3 inches, total length 5 ft. 7 inch. (Fr.) tail 1 ft. 4 inch.

Habitat. Liberia and Gaboon. Two specimens, one presented by Dr. William Blanding, the other by Dr. Henry A. Ford.

Gen. Remarks. We formerly placed this serpent in the genus *Dipsas*, from its large head, compressed body and the large row of hexagonal scales along the middle line of the back; but a careful examination of the teeth, as well as of the external form, shows that it does not belong to that genus; it is one of the most remarkable of the Arborescens Opisthophis, so characteristic of the herpetological fauna of the western coast of Africa; we had supposed also that this serpent might be identical with the *Dipsas cynodon* of Schegel, (*Opetiodon cynodon* D. and B.) but in *Opetiodon* there is but one pre-ocular, the flanks are rounded, pupil oval, &c. The frontal and supra-ocular plates in *Toxicodryas* are quite different in shape from the corresponding plates in the figure of *Dipsas cynodon* by Prof. Schegel (*Abbildungen*, pl. xi. fig. 10 and 11,) the supra-oculars being more narrow in front, the frontal more narrow posteriorly; the two last supra-labials are different in shape and much larger in *Toxicodryas* than in fig. 11. In *O. cynodon*, the pre-oculars are almost contiguous to the frontal, in *T. Blandingii* they are separated by an interval of about a line, seven or eight temporals instead of five, of which three touch the post-oculars (two in *T. Blandingii*.) *Cynodon* is a native of Java and Borneo. The characters

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of the serpent above described, resemble much those of *Triglophodon fuscum*, also from the Gaboon, (D. and B. vol. vii. p. 1102, Appendix,) but it has *three* channelled posterior teeth. There can be no doubt that although allied, *Toxicodryas* and *Triglophodon* are distinct genera; compared with a specimen of *Triglophodon dendrophilum* from Java, of which we have a fine specimen in our collection, due to the liberality of the administration of the Garden of Plants, through Prof. Duméril, we find that the scales in *T. Blandingii* are more narrow, the tail longer and more slender, and the plates upon the head different; the vertical in *T. Blandingii* is much more narrow posteriorly, the rostral not so high, the parietals are much smaller; there are *two* pre-oculars, and the inferior margin of the orbit is formed by the fourth, fifth and sixth supra-labials; in *Triglophodon* by the third, fourth and fifth, &c. Both have a large row of scales along the middle of the back. *Toxicodryas* is a genus quite distinct from *Tarbophis*, (*Ailurophis*, Bonap.)

Sub-Ord. *Proteroglyphs*.

Among the serpents in the collection of Dr. Ford, is one of the black variety of *Naja*, six feet $3\frac{1}{2}$ inches in length. There is also a younger and much more slender specimen. Besides these we have another and much larger one than either, presented several years ago by Dr. Ford, measuring 6 ft. $9\frac{1}{2}$ inch. (Fr.) in length. Neither of these correspond with the description or figure of the black variety of *Naja haje* in Dr. Smith's work on the Reptiles of Southern Africa. The most striking difference consists in the coloration, the South African species being uniformly black below, the variety from the Gaboon having upon the anterior part of the abdomen a greater or less number of black bands of unequal breadth, the interspaces being yellow, the throat and chin also yellow, (white probably during life). Duméril and Bibron state that the Museum of Paris possesses three large specimens of the black variety described by Dr. Smith, one from Senegal, one from Morocco, the third from the White Nile. They admit but two species of *Naja*, the tripudians and *haje*; in the first the sixth superior labial is quite small, in the latter very large; which also wants the spectacle figure upon the neck, and the neck is less dilatable.

This difference between the labial plates, however, is presumed to be not an invariable character. In the plate of *Naja haje* in the great work on Egypt, there are several black bands passing across the abdomen, *near its middle*, one of them very broad, more so than in any of the Gaboon specimens, which in that variety are also situated much more anteriorly. Duméril and Bibron state that in the greater part of the specimens they possess from Java, Sumatra, China and different regions of the East there are several *gastrostega* of a beautiful black, forming a transverse band more or less broad, followed by other scutes of a white color. Comparing the large Gaboon specimen with *A. tripudians*, from Bengal, I find a single dark colored band nine lines in breadth, running across the anterior part of the abdomen, quite near to the throat, and as stated by Prof. Schlegel the sixth supra-labial much smaller than the corresponding one in the African species. In the tripudians this plate is separated from the post-oculars by a large plate, in *N. haje* it is in contact with them. There is a difference in the proportional size of the inter-nasals and pre-frontals, but this may be merely the effect of age; for, although the former are comparatively much smaller than the latter in the *adult* W. African specimens, they more nearly correspond in the younger individual as they do in that from Bengal. The frontal plate is pentagonal in both, but in the Asiatic specimen it is quite narrow.* In the E. India serpent there are 23 rows of scales near the middle of the body, in the Gaboon but 19. We have not the materials for a thorough study of the two admitted species, but consider those from Gaboon as belonging to a variety of the *haje*, for which the name *melano-*

* In the plate of the head of the tripudians in Prof. Traill's translation of Schlegel it is represented as quite broad, perhaps the adult.
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leuca might be given, with the following characters: Length over seven or eight feet; color black above and beneath, in much the greater part of its length; chin white, neck and anterior part of abdomen white, with black transverse bands varying in breadth, with white interspaces of unequal extent; sides of head white or yellow, the margins of the labial plates bordered with black; 19 rows of scales. Ab. sc. 213, sub-caud. 66.

Dimensions. Length of head $2\frac{1}{2}$ inches; greatest breadth 2; length of tail 1 ft. $1\frac{1}{2}$ inch. Total length 6 ft. $9\frac{1}{2}$ inch.; circumference $4\frac{1}{2}$ inch. Three specimens in Mus. Acad. N. S., presented by Dr. Henry A. Ford.

Gen. Remarks. This is one of the largest and most savage looking of the venomous serpents. Dr. Smith gives from 5 to 6 feet as the length of the South African species. According to him they feed on small quadrupeds, birds and eggs, and climb trees readily to rob nests. The genus *Naja* belongs to the 4th section or sub-order of Ophidians in Dumeril and Bibron's arrangement, viz: The Proteroglyph or Apistophid serpents (serpents Proteroglyphes dits Apistophides,) of which the essential characters given are,—

"Serpents in which the anterior teeth are channelled and not perforated at their base," and to the first group into which this section is subdivided, viz: the Conocercal Proteroglyphs, (*P. conocerques*) having a conical or rounded tail; the second group, the platycercals, and which live in the water having this organ flat. The family of Conocercals includes nine genera, viz: *Elaps*, *Pseudoeleaps*, *Furina*, *Trimersurus*, *Alecto*, *Sepedon*, *Causus*, *Bungarus*, *Naja*, two-thirds of which exist in our collection. In the largest of the three specimens there are two large and strong anterior channelled teeth, of about equal length on the left side; on the right side one, having behind it one or two smaller teeth. In the other specimen but a single one is seen on each side; palatine and pterygoid teeth in two longitudinal rows.

Ab. Scut.....	213	1	Sing. Preanal, sub-caud.....	66
"	221	1	"	65
"	219	1	"	64

the tail terminating in a sharp pointed cone.

Another of the formidable serpents with which W. Africa abounds is the *Echidna nasicornis*, *Cerastes nasicornis*, Wagler, of which Dr. Ford's collection contains one fine specimen.

ECHIDNA NASICORNIS, Merrem.

Syn. *Col. nasicornis*, Shaw, Misc. 94, Gen. Zool. v. iii. p. 297, pl. 204.

Vipera nasicornis, Daudin, Rep., vol. iii. p. 322.

Vipera nasicornis, T. Reinhardt, Beskrivelse af Nogle nye Slangenarter, 1843. T. iii. fig. 8, 9, 10.

Cerastes nasicornis, Wagler, Amph. p. 150.

Echidna nasicornis, Merrem, Tent. p. 178.

Clotho nasicornis, Gray, Zool. Mss. 69. Cat. Br. Mus. Rept. p. 25.

Vipera hexacera, Dum. et Bib., T. vii. p. 1416, Atlas pl. 78, bis. fig. 2.

We have now three specimens of this deadly but magnificently robed serpent in our collection, two adult and one very young, all from the Gaboon; the serpent formerly figured in the Proceedings (1847, vol. iii. p. 320) having been lost. We are ourselves now somewhat in doubt in regard to the animal described and figured in the Proceed. Acad. N. S., vol. iii. p. 320, (1846—7.) The description of the *Echidna Gabonica*, D. & B., given in the *Erpétologie générale*, corresponds with it perfectly, and no mention is made, nor does the drawing display the narrow headed black mark bordered with yellow, so characteristic of *E. nasicornis*, and the longitudinal bars upon the middle line of the back are not cut in triangle at their extremities, which is the case even in the very young *nasicornis*. Both specimens referred to have unfortunately been destroyed, the skull of the adult alone remaining, which, however, I am inclined to believe belongs to *E. nasicornis*.

As no detailed account of this remarkable animal appears to have been published, we propose to give a full account of it.

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Sp. Char. Three horny projections on each side of the muzzle, the anterior small, the posterior which is immediately over the nostril quite long.

Description. The head is more or less triangular above, covered with scales, very strongly carinated, the carinations so developed as to assume the form of triangular leaf-like projections, giving a sensation of roughness to the latero-superior upper part of the head; there are three or four scales immediately within the circular row above surrounding the eye, which are larger than the others; the carinae of these scales are less foliated than the rest, and resemble spines; the eye is of moderate size, ovoid in shape, and somewhat projecting; the nostrils are large, on a line with the eye, three lines from it and are not lateral, but look upward and outward; there are three foliated scales upon each side of the muzzle, the posterior 6 lines in length; the rostral plate is broad and narrow with a convex margin above, concave below, very different in shape from that of *Vipera ammodytes*; there are sixteen supra-labial plates on each side, most of which resemble each other in shape, presenting a serrated margin inferiorly; there are sixteen superior labials which differ from each other, and the anterior are more extended transversely; the anterior genials are very large; the posterior quite narrow; the pterygo-palatine teeth do not pursue a strictly longitudinal course but diverge posteriorly; the fangs are enormous and lie entirely concealed in their sheath; the neck is more narrow than the posterior part of the head, the body quite thick at the middle; the tail rather short, terminating in a horn-like pointed projection; the scales are short and broad, strongly carinated, the inferior row much the largest; 44 may be counted in a row near the middle of the body; 18 on each side of the neck, 16 rows at the base of the tail. Ab. scuta 128; sub-caud. 31; 1 long preanal.

Coloration. A dark jet black arrowheaded blotch upon the top of the head commencing between the posterior horns, its hinder extremities reaching as far as the posterior margin of the head, the middle portion being lost upon the neck; this blotch has a narrow border of yellow; upper and lateral part of the head brownish, or brownish mingled with yellow; a narrow stripe of yellow commencing near the middle of the range of scales which margin the orbit below, and terminating at the inferior margin of the twelfth supra-labial, less distinct in older specimens; posterior to this a large dark-colored triangular blotch reaching from the eye to the angle of the jaw; a small triangular yellow one upon the side of the head close to its anterior margin, its apex reaching to within a line of the eye; the intervening space between it and the narrow yellow stripe, dark colored, as well as that part of the side of the head in front of the eye reaching to the anterior extremity of the muzzle, on a line with the inferior border of the nostril; upon the middle line of the back and tail a series of oblong yellow blotches, with triangular emarginations anteriorly and posteriorly, imbedded in a black ground; sides dark brown, in younger individuals mingled with reddish and yellow, black spotted; the lateral extension of the dark colored blotches in which the yellow bars are imbedded triangular in shape; a series of yellow spots on each side at the point of juncture with the abdominal scutes; chin and throat orange mottled with black; abdomen and under part of tail yellow, thickly mottled with black.

In a very young specimen measuring $10\frac{1}{2}$ inches in length, the coloration of the head is nearly the same, the middle line of the back presenting a longitudinal series of black rhomboids alternating with the lighter colored bars with triangular emarginations; these bars are much shorter upon the anterior part of the body and upon the neck; the posterior prolongations of the arrowheaded blotch upon the head extend half an inch upon the neck, and present a triangular cut posteriorly; there is a series of large dark colored spots upon the sides alternating with yellow; chin and throat dark colored; abdomen thickly maculated with dark subquadrate spots.

Dimensions. Length 2 inches 3 lines; breadth 1 inch 11; length of body 2 feet 8 inches (Fr.) of tail 6 inches 7 lines. Total length 3 feet 4 inches 10 lines; circumference 6 inches.

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Habitat. Gaboon and Liberia. Three specimens in Mus. Acad. presented by Dr. Henry A. Ford.

Gen. Remarks. Duméril and Bibron are evidently in error in placing this animal in the genus *Vipera*. In *Vipera* the nostrils are lateral, in *Echidna latero-superior*. In *Vipera ammodytes* the rostral plate is very high; the posterior genials differ much; *ammodytes* has a large supra-ocular; there is but one row of plates between the supra-labials and the rows of scales which surround the eye; the scales in *ammodytes* are long, short in *nasicornis*. The same may be said of *Vipera aspis*. Compared with *Echidna arietans* of the Cape, we find absence of the supra-ocular, two rows between the scales beneath the eye and the supra-labials, and the scales short, like those of *nasicornis*. The difference in the number of rows of scales between the eyes and the supra-labials constitutes a good *specific* character in serpents belonging to the same genus, but the position of the nostrils and the form of the scales are constant and of generic importance.* *Echidna nasicornis* belongs to the 5th section or suborder of Ophidi-ans in Duméril and Bibron's arrangement, viz., the Solenoglyphs, (serpents Solenoglyphes dits Thanatophides,) of which the following are the essential characters:

"Serpents having teeth in both jaws, of which the anterior supra-maxillaries are alone channelled and perforated by a canal in the length of their base."

Ord. BATRACHIANS.

In the synoptical table of the genera of Raniforms, in the 8th volume of Duméril and Bibron's work, (1841,) but two genera of the 16 there determined are mentioned as having no palatine teeth, viz., *Oxyglossus* and *Leiuperus*; the first with a rhomboidal, the second with an oval tongue, in both entire. In *Arthroleptis*, Smith, (Illustrations of South African Zoology, 1849,) the toes are without webs. In the Batrachian now under consideration, the most remarkable structure is shown in the tongue, which presents a central pedicel, but is bound down in its anterior half along the middle by cellular tissue, as in the genus *Heredia*, among the Urodeles recently discovered in California. We propose for this remarkable Batrachian, and which, should this conformation be found to exist in other individuals, would, from the connecting link between the Anurous Batrachia, and the Caducibranchiate Urodeles, the name of

HETEROGLOSSA.

Head nearly as long as the body, and about as long as broad, depressed above, narrow in front; teeth in the upper jaw small, smaller in front, posteriorly recurved, sharp-pointed; nine in the lower jaw; *no palatine teeth*; posterior nares suboval, eustachian foramina small; tongue suboval, deeply notched posteriorly, attached by a cylindrical pedicel at the centre, entirely free in its posterior half; bound down anteriorly along the middle line by cellular tissue, reaching from the tip to the pedicel, free laterally except at the apex; body short; toes free anteriorly, webbed at their base posteriorly; tympanum distinct.

HETEROGLOSSA AFRICANA, nov.

Sp. Char. Chocolate brown above, abdomen ash colored; posterior nares small.

Description. The head is about as broad as long, triangular in shape, rounded in front, depressed above; the eyes are of moderate size, not prominent; the tympanum also of moderate size, quite distinct, is situated immediately over the angle of the jaw; posterior nares suboval, small; the fingers are quite free, the first and second of about equal length, the fourth longer than these, the third the longest; sub-articular tubercles distinct; extremities of first and second toes nearly on a line with each other; third toe longer than second, the fourth much

* Since the above was written we have received the December number of Guérin (Revue et Magazin de Zoologie, 1856,) in which I find that Prof. A. Duméril has himself corrected this error.

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the longest, the fifth longer than either the first or second; the toes are webbed at their base, the web extending to about the middle of the antepenultimate phalanx; abdomen perfectly smooth; skin smooth above; no rows of pores visible.

Coloration. General color dark brown, or chocolate above, mingled to a slight extent with ash; upper jaw presenting several chocolate colored spots upon a lighter ground; posterior extremities barred with dark brown approaching to black; abdomen ash colored; chin and throat chocolate spotted; under surface of extremities blackish mingled with ash; when examined with a magnifier the body appears to be blotched all over with dark brown on a much lighter ground.

Dimensions. Length of head and body 1 inch; length of head $5\frac{1}{2}$ lines; breadth 5; from tip of snout to anterior extremity 5; distance between anterior and posterior extremities 5 lines; length of arm 3 lines; of forearm $2\frac{1}{2}$; of hand to extremity of longest finger 3 lines; of thigh $5\frac{1}{2}$ lines; of leg 6 lines; of foot to extremity of longest toe $5\frac{1}{2}$ lines.

Habitat. Gaboon. One specimen in Mus. Acad. N. S. presented by Dr. Henry A. Ford.

HYLA PUNCTATA, nob.

A young specimen of *Hyla punctata*, nob., Proceed. Acad. N. S. vol. vii. p. 193.

It measures 1 inch 4 lines in length from the extremity of the snout to the posterior extremity of the body; head large; body very slender posteriorly; the color is of a darker brown than in the adult, and a number of darker blotches may be observed over different parts of the animal; a characteristic mark, and one which does not appear to have been mentioned in the previous description, consists in the presence of an orange-colored undulating line a short distance above the anus, commencing on the posterior part of the thigh about two lines from the latter; beneath this line the ground color is more obscure. This line exists also in the adult specimen, but is of a yellow color.

PIPADÆ.

DACTYLETHRA, Cuvier.

There is one specimen of *Dactylethra*, but this differs from the *Dactylethra* of the Cape, and more especially in the presence of a sharp pointed spur projecting from the cuneiform bone, which is not observed in *Dactylethra capensis*.

DACTYLETHRA MÜLLERI, Peters.

Sp. Char. Black above, dark brown or chocolate below; a cutaneous appendage beneath each eye; numerous crypts upon the muzzle, chin, and under part of the muzzle; a series of larger longitudinal glands upon chin; a sharp pointed spur at base of first toe.

Description. The head is small, depressed; the snout rounded; the eyes prominent; the nostrils near the extremity of the snout a line apart, and three-fourths of a line from the anterior border of the eye; the snout is quite smooth above, but covered as far as midway between the eyes, (the posterior border of which is but three lines from its anterior extremity,) with numerous small elevated granules or crypts, the under part also, as well as the chin; a semicircular row of longitudinal glands, nine or ten in number, with open mouths, four or five in each longitudinal row upon the chin; no tongue or palatine teeth; numerous small teeth in the upper jaw; eustachian foramen large, broader than long; body large, subquadrate, about a line broader posteriorly, where, as Dumeril and Hübner observe, it has the appearance of being truncate; perfectly smooth both above and below; with a magnifier, however, presenting a minutely granular appearance; no lateral line of pores visible; anterior extremities small, posterior very large; fingers free; fourth finger stoutest, second longest, third not as long as second, first and fourth of nearly equal length; thighs and legs

greatly developed; toes webbed as far as distal extremity of first phalanx, the three first provided with a nail, sharp pointed, slightly incurvated; these nails are convex above, but present a ridge along their middle below; a sharp pointed short spur at the base of the first toe; second toe longer than first, third longer than second, fourth and fifth of nearly equal length; no subarticular tubercles visible; posterior extremities smooth both above and below, no pores upon the thighs.

Coloration, as given in the specific characters.

Dimensions. Length from tip of snout to anterior extremity 6 lines; between anterior and posterior extremities 10 lines; of arm $1\frac{1}{2}$ lines; of forearm 3; of hand to extremity of longest finger $3\frac{1}{2}$ lines; of thigh 6 lines; of leg 7; of foot to extremity of longest toe (the third) 8 lines.

Habitat. Gaboon. One specimen presented by Dr. Henry A. Ford.

Gen. Remarks. *Dactylethra* belongs in Duméril and Bibron's arrangement, to the second group of the Anouroids, or Phrynaglossal Batrachians, (Phrynaglosses) and family of the Pipæformes, being entirely destitute of a tongue, whereas the 1st group, or the Phaneroglossal, have this organ "developed in a greater or less degree." The Phrynaglossal Batrachians, including but two genera at present known, viz., *Dactylethra* and *Pipa*, have also this very remarkable peculiarity, that instead of two eustachian foramina, there is but one, and that situated at the middle of the posterior part of the palate. In *Dactylethra Müllerii* this is very large. We had proposed for this singular Pipæform the name *spinosa*, from the spur at the base of the first toe, but having received the 12th number of the *Revue de Zoologie* for 1856, we find it mentioned and referred to in the interesting and important paper of Prof. Aug. Duméril, with the well known and honored name *Müllerii* given to it in 1844 by Prof. Peters of Berlin, (*Monats Bericht ber Kon. preuss. Acad. zu Berlin*, 1844, p. 37) who has found it also in Mozambique.

Having now finished the notice of Dr. Ford's collection, which contains so many animals new to science and of great importance in the study of the geographical distribution of Reptiles, I propose to correct some errors in former papers of mine upon the Reptiles of Western Africa—which either had escaped my attention, or which a better knowledge of the subject, and the aid of my vade mecum in that branch of science, Duméril and Bibron, have enabled me to point out. *Pachydactylus tristis* appears to be identical with *Platydictylus theconyx*, a common West India animal, the label indicating the locality having been erroneous. *Tropidolepis Africanus* and *Calotes versicolor* are identical with *Agama Colonomum*. *Python Liberiensis* is identical with *Python bivittatus*, (*Python Sebae*, D. & B.) admirably described by Prof. Schlegel and long known.

BOA LIBERIENSIS. *Proceed. Acad. N. S.*, vol. vii. (1854) p. 100.

The animal indicated is not identical with *Python Liberiensis*, (*Python bivittatus*, Schlegel,) the latter specimen having at the time been mislaid, but is the young of *Epicrates cenchris* from S. America.

Fam. *SYNCRATERIANS*, (innocui.)

DENDROPHIS FLAVIGULARIS, *Proceed. A. N. S.* vol. vi. p. 205.

The Aboricoles serpent described in the Proceedings of the Academy with the above name is not a *Dendrophis*, but presents characters quite sufficient to constitute it a new genus. It differs from *Dendrophis* in the following particulars: 1st. *Dendrophis* is an Isodontian, the teeth having equal proportions, the *Synchraterians* having the posterior longer. 2d. It wants the larger row of scales along the median line of the back, characteristic of *Dendrophis*. 3rd. The eye in *Dendrophis* rests on the fifth and sixth supra-labials. 4th. The rostral appears more upon the top of the head, and the internasals are proportionably larger. 5th. In *Dendrophis* the frontal is more acute posteriorly, and the parietals are longer than broad. 6th. In *Dendrophis* the frenal is long and narrow and not quadrate; there are two post-oculars instead of three, and the temporal plates are more numerous. 7th. The neck is more narrow in *Dendrophis*, the abdomen is angular and the scales are smooth. In *Herpetodryas* (Isodontian) the

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rostral opens in a *single* plate, there is but one post-ocular, the parietals are long, the eye rests on the third and fourth supra-labials, and the shape of the scales is very different, being lanceolate and not long and quadrangular; the internasals are smaller in proportion, the rostral does not extend so far backward on the top of the head, and the frontal differs in shape; it approaches more nearly *Leptophis* (*Syncraterian*), a genus also existing on the West Coast of Africa, but in *Leptophis*, the internasals are proportionately *larger*, the frontal more acute posteriorly, the rostral quite different in shape, the frenal long and narrow, but two post-oculars, the eye resting on the fifth and sixth supra-labials, the latter plate being much prolonged at its posterior and superior angle, and the posterior genicals, or intermediate sub-maxillary plates, are longer than the anterior and more narrow. In *Bucephalus* the scutes beneath the tail are bifid for one-fourth of its length, simple in the remainder, and the posterior teeth are channelled (*Opistoglyph*); we propose therefore for this remarkable *Arboricole* Ophidian the generic name

THRASOPS.*

Gen. Char. Head long, flat above, somewhat truncate anteriorly; shelving in front; rostral extending upon the top of the head; internasals of about same length as pre-frontals; frontal three and a half lines in length, and about as broad anteriorly, rounded posteriorly; parietals short and broad, nostril between two plates; a quadrangular frenal; one antocular, three post-oculars; eye resting on the fourth and fifth supra-labials; pupil circular; posterior genicals broader than the anterior; teeth of the upper maxillaries *Syncraterian*, the posterior twice as long as the anterior, not channelled, but trenchant, the preceding ones sharp pointed, a wide space in front destitute of teeth; pterygo-palatine teeth small, in two nearly parallel rows; mandibular teeth presenting no larger or longer ones anteriorly, the posterior ones a little shorter; neck nearly as broad as posterior part of head, body long, rather stout in the middle, covered with long and quadrangular imbricated and carinated scales of about equal breadth except those of inferior row which are broader and shorter than the others; scales and scutes presenting a silken appearance; abdomen angular but not distinctly so, the gastrostega ascending obliquely upon the flanks; tail long, sub-caudal scutes bifid.

THRASOPS FLAVIGULARIS, nob.

Sp. Char. 13 rows of scales; jet black black above with a silken lustre, mingled with brown upon the head; lips dove color; chin and throat white, or light yellow; neck white or light yellow, black spotted; abdomen and under part of tail black or yellowish; length 5 ft. 10½ inch. (Fr.)

Habitat. Gaboon; two specimens in Mus. Acad. N. S. one presented by Dr. Henry A. Ford, the other by Mr. DuChailu.

Gen. Remarks. The description in the 4th vol. of the Proceedings is quite accurate, and characterizes this serpent well, except its dentition. Its jet black and silken lustre, and large and somewhat impudent eyes, make, we should think, this reptile one of the most remarkable among the *Arboricole* Ophidians so numerous in Western Africa.

Coronella triangularis, nob. *Proceed. Acad. N. S. vol. vii. p. 140.*

Coluber laevis, *Proceed. A. N. S. Vol. ii. p. 118.* This serpent described under the above names, is not a *Coronella*, but belongs to a new genus of *Syncraterians*, for which we propose the name

HETERONOTUS.

Gen. Char. Dentition of *Coronella*. Head long, temples somewhat swollen, eyes of moderate size, nostrils latero-superior between two plates; a short frenal; one pre-ocular; two post-oculars; eight superior labials, the eye resting on the fourth only; a broad rostral; two internasals rather long; two broad pre-frontals.

* *Opharos*, audax, and *oculus*.

tails; a long hexagonal frontal; two supra-orbital, and two parietal plates, the latter of moderate length; a small occipital; neck more narrow than posterior part of head, body cylindrical, covered with broad quadrangular scales at the sides, hexagonal above; tail rather long and tapering, sub-caudal scutes bifid.

HETERONOTUS TRIANGULARIS, nob.

Sp. Char. Color light olive above, with about fifteen narrow transverse yellow fasciæ from six to eight lines apart, commencing on the neck and terminating near the middle of the body; a series of triangles, olive and yellow upon the sides, the one inosculating with the other, the yellow lines upon the back conjoining the apices; 17 rows of scales near the middle; ab. sc. 148, 1 bifid pre-anal; sub-caud. 100.

Description. The head is long, narrow and rounded in front, somewhat protuberant at the temples, covered above with nine plates exclusive of a very small one looking like an occipital; the rostral measures about two lines in breadth by one in height; presenting more or less distinctly three facets above, the two exterior in contact each with the naso-rostral, the middle with the internasals, the external margin convex, the inferior concave; the naso-rostral is quadrangular, the naso-frenal rhomboidal in shape; the frenal is also quadrangular with its supero-posterior angle rounded; the two nasals are in contact above with the internasals, the frenal with the pre-frontal; the pre-ocular is large, its superior portion much more so than the inferior; rectangular below triangular above, presenting an anterior and posterior angle and one superior, in contact inferiorly with the third and fourth supra-labial, above with the pre-frontal and supra-ocular; there are two post-oculars, the inferior prolonged forward, its anterior portion between the fifth supra-labial, and the eye, which reclines upon it; the internasals are longer than broad, the pre-frontals on the contrary remarkable for their breadth; they pass down on the side of the head between the naso-frenal and pre-ocular, to reach the frenal as above described; the frontal is remarkable for its length, and in this respect differs greatly from *Coronella*, in which it is short, and broader than long; it is hexagonal and more narrow posteriorly; the supra-oculars are much longer than broad, more narrow in front; the parietals are of moderate size, in contact anteriorly with the supra-ocular and the superior post-ocular; there are eight superior labials on the left side, the seventh and eighth on the right being fused together and presenting one large plate; the inferior margin of the eye rests on the fourth, which is more distinctly quadrangular, than any of the other superior labials; there are five plates between the supra-labials and the parietals, two in front and three posteriorly; the anterior genaeals are somewhat broader than the posterior and not quite so long; the supra-maxillary teeth are long, smooth, unequally spaced, the posterior teeth the longest, the two anterior more recurved than the others; pterygo-palatine teeth much smaller, straight, their points thrown far backward, in two long rows; these rows are not parallel, but approach each other near the middle, and diverge anteriorly, the two presenting a long urceolate outline; the teeth in the lower jaw are much smaller than those in the upper, shorter anteriorly; the neck is more narrow than the head posteriorly, the body more or less cylindrical and much thicker in the middle, decreasing toward the tail, which is of considerable length, and tapers to a point; there are 17 rows of smooth scales near the middle of the body, the same number upon the neck, 13 upon the tail near its root; the inferior row of scales is the largest; those upon the sides about as broad as long ($1\frac{1}{2}$ line,) quadrangular; those upon the back distinctly hexagonal, and somewhat narrower; this difference in the form of the scales is indistinct upon the neck and posterior part of the body; gastrostega rather broad but not ascending upon the flanks which present no marked angularity.

Coloration. Head yellowish above mingled with olive; the three or four posterior of the superior labials bordered inferiorly with black, as well as the posterior margin of the fourth; several of the inferior labials margined with black; chin and throat yellow, black spotted; ground color olive above, with about [Feb.

15 narrow yellow transverse fasciæ, extending a short distance beyond the anterior half of the trunk; a series of lateral olive colored triangular markings, 28 in number, on each side of the neck and body continuous with the ground color above, and the apex inferior, the same number of yellow ones inosculating with the latter, and continuous at their bases with the yellow ground color beneath; the transverse fasciæ terminating laterally at the apices of these yellow triangular interspaces; throat, abdomen, and under part of tail yellow, with numerous bluish or olive colored spots.

Dimensions. Length of head one inch; greatest breadth 7 lines; length of body 1 ft. 4 inch. 3 lines; of tail 8 inch. (Fr.)

Habitat. Liberia; one specimen in Mus. Acad. presented by Dr. William Blanding.

Gen. Remarks. The previous description in vol. ii. of the Proceedings contains a number of absurd typographical errors,—and is in many respects incorrect. This genus is closely allied to *Coronella*, but differs from it in the shape of the frontal plate which is short and broad in the latter genus, in the form of the internasals which are longer in *Heteronotus*, in the pre-frontals which are not so long, the position of the eye and the shape of the scales; the tail is much shorter in *Coronella*, and the teeth not so strongly developed. *Heteronotus* is another of the many remarkable forms recently discovered in Western Africa, which promises to present the most valuable materials to the Zoologist in the determination of the higher problems of science.

Sub-Ord. *Opisthophis*, (venenosi.)

PSAMMOPHIS PHILLIPSII, nob. Proceed. Acad. N. S. vol. vii. p. 100.

Coluber Phillipsii, id. Proceed. vol. ii. p. 169. The head of this species presents numerous singularly shaped black markings above; the lips, chin and throat, thickly spotted with black; ground color of chin and throat yellow; the black points are much more distinct upon the flanks, scarcely visible upon the back; *gastrostega* marked near their external extremities with a longitudinal black mark or spot; preanal scale single; dorsal row of scales differently shaped from the others; two or three inferior rows of scales, larger than the rest, which, except the dorsal row, are long, slender and quadrangular as in *Dendrophis*; 17 rows; tail mutilated. This species of *Psammophis* differs from all those described by Duméril and Bibron.

Among the serpents not in the collection of Dr. Ford, but from Liberia, and presented several years ago by Dr. Goheen, is a small *Psammophis*, probably young, with 17 rows of scales, and 102 sub-caudal scutes. The coloration of the head is different from that of the specimen just described.

Char. Head marked with dark colored irregular lines, simulating Arabic characters, more especially upon the parietals; a more regular figure, long and quadrangular in shape upon the frontal; color greenish with a double row of black spots at the posterior margin of the abdominal scutes near their external margin; lips black spotted; chin and throat white; ab. scut. 164, 1 single preanal, sub-caud. 102, 17 rows of scales.

Gen. Remarks. The shape and arrangement of scales are the same as in *Phillipsii*, the dorsal row differing from the others, being more narrow anteriorly; (probably the young of the preceding species.)

DIPSAS CARINATUS. Proceed. Acad. N. S., vol. ii. p. 119.

This description contains numerous typographical errors; thus, the vertical plate is put for the rostral, the nostril for the eye, &c. The name is pre-occupied, having been given to a species of *Pareas* (Wagler) by Prof. Reinhardt, (*Dipsas carinata*), from Java. The teeth in this specimen are all lost, so that it is impossible to say to what genus it really belongs.

CARINATUS.

Sp. Char. Color light or yellowish above with about 75 transverse narrow
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irregular lighter colored yellow fasciæ, terminating at the external margin of the abdominal scutes; chin and throat yellowish; abdomen greenish, mingled with yellow; tail olive above, white below. Length 2 ft. 1 inch $2\frac{1}{2}$; ab. scut. 247; sub-caud. 73; 1 single preanal.

Description. The body is much compressed; the scales all distinctly carinated; seventy-five oblique narrow yellow bands may be counted upon the body; head yellowish above, marked with dark colored irregular lines; the most conspicuous of these are two irregular ones over the eyes and two large ones meeting upon the middle of the frontal, and diverging in a V-shaped form, and extending as far as the posterior margin of the parietals, the right branch in the specimen examined continuous with another extending a short distance upon the neck; these dark colored lines present longitudinal patches of yellow within; scales of moderate length, rather narrow, presenting an angle posteriorly, the carinæ in the middle, and running the whole length of the scale, the inferior row the broadest; 22 rows near the middle of the body; on either side three rows of narrower scales in the specimen examined, immediately above the second inferior row; flanks angular, abdomen flat, but the gastrostega not ascending upon the sides of the body; tail of moderate length, tapering to a point. *Plates of head.* A rostral broader than high, not extending upon the snout, two inter-nasals and two pre-frontals, the former smaller than the latter; a frontal longer than broad, quite broad anteriorly, ($2\frac{1}{2}$ lines nearly by 2 in breadth,) more narrow posteriorly, distinctly hexagonal; parietals well developed, rather long, broad in front; supra-orbital long and narrow, presenting two facets displaying an angle anteriorly, the superior in contact with the pre-frontal, the inferior with the ant-ocular and two posterior, the inferior in contact with the superior post-ocular, the superior, which is greatly extended, with the parietal; nostril between two plates, the posterior much the larger, there being apparently no frenal; a single and large pre-ocular broader below; two post-oculars, the inferior the larger of the two; temporal plates but two in number (one above the other,) between the supra-labials and parietals; eyes of moderate size, round, resting on the third and fourth supra-labials; seven superior labials, the fifth quadrangular, the sixth and seventh the largest; anterior genials broad, the posterior singular in shape, broad, their external margin three or four times longer than the internal; ab. scut. 247; sub-caud. 73; length of head 8 lines; breadth $4\frac{1}{2}$; length of body 2 ft.; of tail 4 inch. 4 lines. Total length 2 ft. 1 inch 4 lines; circumference $1\frac{1}{2}$ inches.

Habitat. Liberia. One specimen in Mus. Acad. N. S., presented by Dr. William Blanding.

Sub. Ord. *Solenoglyphs* (Viperidæ.)

ATRACTASPIS CORPULENTUS, nob.

Syn. *Brachycranion corpulentum*, Hallowell. Proceed. Acad. N. S., vol. vii. p. 99.

This is no doubt a distinct species from the *Atractaspis Bibronii*, Smith, of the Cape of Good Hope.

ATRACTASPIS CORPULENTUS.

Sp. Char. But seven plates upon the top of the head, two pairs only between the rostral and frontal; * eye resting on the fourth supra labial, the third prolonged at its postero-superior angle, touching the eye anteriorly and inferiorly; body much stouter than in *A. Bibronii*; 25 rows of scales, twenty-three upon neck, 20 at posterior extremity of body, commencing at the preanal scale, where the body is only $4\frac{1}{2}$ lines in breadth, 8 lines at the middle; color shining black above, brownish beneath; ab. scut. 182; sub-caud. 26; preanal single. Total length 1 ft. $8\frac{1}{2}$ inches.

Habitat. Gaboon. One specimen in Mus. Acad., presented by Dr Henry A. Ford.

* Future observation must determine whether this be a constant character.

In *A. Bibronii*, the ab. and sub-caud. scuta are given by Dr. Smith as 255, 20, and 225, 21. The drawing in the S. African Illustrations is magnified and therefore the fangs in both animals are probably of equal length. The gastrostega are quite broad, and extend very slightly if at all upon the flanks, which are rounded; the neck is of about the same thickness as the head posteriorly, not so thick as the body at its middle; the geneials are broad and short, there are no posterior ones, properly so called, but a single row of larger scales on each side within the supra-labials, the anterior the longest. The fangs in this serpent are remarkable; they are probably more capable of erection than Dr. Smith supposes, but their shape is peculiar; they are convex anteriorly, concave posteriorly, with a superior and inferior ridge, compressed laterally, with an elevation in the middle, resembling somewhat a squalus tooth, but of course much more narrow; they are not channelled anteriorly, but a canal can be distinctly seen running along their middle, the tooth being perforated at its base. It therefore takes its place among the Solenoglyphs and not the Proteroglyphs, as Duméril and Bibron conjectured it should from its general resemblance to *Elaps*, (a specimen of the animal not having at that time reached the Museum of Paris,) and the family Viperidæ, characterized by the absence of fossettes between the eyes and the nostrils, which on the contrary exist in the Crotalidæ.

Gen. Remarks. We have endeavored in the preceding paper to give as correct an account as our means will permit of the West African Reptiles that have come under our notice. All the specimens described or referred to in previous numbers of the Proceedings as presented by Dr. Ford, come from the Gaboon and not Liberia. This is an important correction, for the two countries are widely separate, Monrovia, the capitol of Liberia being in North or Upper Guinea, and the Gaboon in South or Lower Guinea; the difference in latitude between the above mentioned town and the mouth of the Gaboon where Dr. Ford is stationed as Physician to an American Missionary establishment being 450 miles, and in longitude 1400; the difference in space measured along the line of the coast 1450 miles. This rectification is of much consequence in the study of the geographical distribution of the Reptiles of Africa. When we consider the very great distance of the Cape of Good Hope from the Gaboon, it is not surprising that the reptiles of the latter region should differ so much from those of the former. Indeed, it is doubtful if among all the reptiles figured and described by Dr. Smith, there be two *absolutely* identical and common to both countries.

Dr. Smith mentions the following species known to exist in W. Africa, as found also at the Cape, viz.: *Kinixys erosa*, *Varanus niloticus*, *Chamaeleo dilepis*, *Agama colonorum*, *Dinophis angusticeps* (Naia S.) and *Causus rhombeatus*. He enumerates nevertheless and describes 144 species belonging to 84 genera.

According to Prof. Peters, of Berlin, the following species existing in W. Africa are found also in Madagascar, viz., *Chamaeleo dilepis*, *Oxybelis Kirtlandii*, (Lecomptei, D. & B.) *Echidna nasicornis*, *Dactylethra Müllerii*, (Archiv. für Naturgeschichte, 1855, p. 43,) and (Monatsberichte zu Berliner Academie, 1854, p. 614.)

Few countries probably present a more interesting field to the Herpetologist than Africa, whether we regard the variety or the remarkable character of the forms, and we hope, through the efforts of M. DuChaillu, who is travelling in the Gaboon, with a view to discover if possible the source of the Congo or river Zaire, and of Dr. Ford, who is stationed at the mouth of the Gaboon, that we shall be enabled to develop more fully the Herpetology of that region.

We have prepared the following list of the species inhabiting Liberia and the Gaboon so far as known, and refer to the splendid work of Dr. Smith for those found at the Cape. Those common to the two regions are printed in italics:—

Liberia.

<i>Cinixis denticulata</i> , (erosa B.)	<i>Oxybelis Kirtlandii</i> , H.
<i>Trionyx Mortonii</i> , H.	<i>Dinophis Hammondi</i> , H.
<i>Agama colonorum</i> D.	(<i>Dendraspis Jamesoni</i> , A. D.)
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<i>Euprepes Harlani</i> , H.	<i>Toxicodryas Blandingii</i> , H.
<i>Euprepes Blandingii</i> , H.	<i>Causus rhombeatus</i> , W.
<i>Python bivittatus</i> , S. (P. Sebæ, D. & B.)	<i>Echidna Gabonica</i> , D. & B.
<i>Onychocephalus Liberiensis</i> , H.	<i>Rana Bibronii</i> , H.
<i>Onychocephalus nigro-lineatus</i> , H.	<i>Ixalus concolor</i> , H.
<i>Leptophis smaragdinus</i> , D. & B.	<i>Bufo maculatus</i> , H.

Gaboon.

<i>Cryptopodus Aubryi</i> , A. D.	<i>Boædon quadrivirgatum</i> , H.
<i>Trionyx Aegytiacus</i> , G.	<i>Hormonotus audax</i> , H.
<i>Cinixis denticulata</i> , H.	<i>Lycophidion laterale</i> , H.
<i>Cinixis Homeana</i> , B.	<i>Orybelis Kirtlandii</i> , H.
<i>Hemidactylus angulatus</i> , H.	<i>Toxicodryas Blandingii</i> , H.
<i>Chamæleo gracilis</i> , H.	<i>Dinophis angusticeps</i> , A. D.
<i>Chamæleo dilepis</i> , L.	<i>Echis squamigera</i> , H.
<i>Varanus niloticus</i> , D. & B.	<i>Naja Haje</i> , (var. <i>melanoleuca</i> , H.)
<i>Tachydromus Fordii</i> , H.	<i>Echidna nasicornis</i> , M.
<i>Euprepes albilabris</i> , H.	<i>Echidna Gabonica</i> , D. & B.
<i>Euprepes striata</i> , H.	<i>Atractaspis corpulentus</i> , H.
<i>Euprepes Blandingii</i> , H.	<i>Triglophodon fuscum</i> , D. & B.
<i>Sphenorhina elegans</i> , H.	<i>Cæcilia rostrata</i> , C.
<i>Gerrhosaurus nigro-lineatus</i> , H.	<i>Rana subsigillata</i> , A. D.
<i>Phractogonus galeatus</i> , H.	<i>Lymnodytes albilabris</i> , A. D.
<i>Leptophis smaragdinus</i> , D. & B.	<i>Hyla Aubryi</i> , A. D.
<i>Chlorophis heterodermis</i> , H.	<i>Heteroglossa Africana</i> , H.
<i>Boædon quadrivittatum</i> , H.	<i>Dactylethra Müleri</i> , P.

Nothing is more striking in the study of the various reptilian forms above described than the simplicity of the elements out of which so great a variety of essential characters are deduced, constituting generic types, permanent in their nature, and linked from the beginning with circumstances of physical geography not yet fully made out, but which a more thorough and accurate analysis may enable us to discover. It is probable that a careful and precise investigation of the genera now determined, even by the most eminent Herpetologists, taking into consideration not one or several sets of characters but the entire animal viewed in regard, not only to its anatomy, which is of equal importance, but also its geographical position, and so to speak, its physiology, will of necessity cause many of them to be separated, constituting either distinct generic forms, or sub-generic types, associated naturally with the physical characters of the soil and climate in which they live; and hence it is of the utmost importance that those animals not liable to changes of domicile as is the case with birds, and even the mammals, should be collected from all known regions of the globe, their habitat being ascertained with the greatest precision, and their anatomy studied with care, so that we may be enabled to deduce the laws which govern their existence, and determine their characters, which cannot be done for a long time to come, and until the facilities for the prosecution of such pursuits are much greater than exist at the present time, but which we have no doubt will ultimately be accomplished. Natural History, physical geography and physiology are so intimately connected, that no real progress can be made without their combined study; and in this manner instead of the artificial and disjointed aspect which the first of these has often been made to present, we shall have a system based upon nature itself, the only true and real foundation of all progress whether in science or morals, or in the solution of those perplexed problems which at present so much and so fruitlessly disturb the public mind. Inquiries of this kind, so far from promoting a spirit of irreverence, induce the contrary, leading man not only in the letter, but better in the spirit, and in the real constitution of things, to search out the laws which determine his well being, and give rise in him to the most profound sentiments of humility and worship of the great Creator, whose intelligence and power at every step excite his wonder and admiration.

[Feb.

The death of Dr. E. K. Kane, U. S. N., late a member of the Academy, was then announced; whereupon the following resolutions, offered by Mr. Cassin, were unanimously adopted :—

Resolved, That the Academy has heard of the decease of its distinguished member ELISHA KENT KANE, M. D., of the United States Navy, with deep sorrow, and regards it as a loss to the cause of science, and to the country.

Resolved, That the great abilities and enterprise of Dr. Kane entitle him to the highest rank among scientific voyagers and explorers, and that his many and valuable contributions to the collections of the Academy, and his constant interest in it, entitle him to special regard.

Resolved, That this Academy will attend the funeral of Dr. Kane, and that a special meeting be called for that purpose.

Resolved, That a copy of these Resolutions be transmitted to the family of Dr. Kane, and that the same be published.

March 3d.

Vice President BRIDGES in the Chair.

Dr. Uhler stated :

That on the night of the 10th inst., about 11½ o'clock, he was startled in his residence at Manayunk, by a heavy rumbling noise, and shaking of the house and furniture, and rattling of the windows; the sound resembled that of a heavy wagon drawn over hard frozen ground. In the course of four or five seconds, the noise and trembling were repeated. Dr. U. raised the window immediately, but found everything perfectly quiet; there was no wind, and he attributed the noise to an earthquake.

The sound appeared to come from the north east, and then returned; the whole duration was probably twenty seconds. He had no means of determining the amount or direction of the oscillation.

March 10th.

Vice President BRIDGES in the Chair.

Communications were presented for publication in the Proceedings, entitled :

Contributions to the Neuropterology of the United States, No. 1, by Philip R. Uhler.

Descriptions of twelve new species of Naiades, by Isaac Lea.

And the following for publication in the Journal :

On the Caducibranchiate Urodele Batrachians, by Edward Hallowell, M. D.

On Trigonophrys rugiceps, by Edward Hallowell, M. D.

Which were respectively referred to Committees.

Dr. LeConte announced the decease of Prof. J. W. BAILEY, of West Point, a correspondent of the Academy.

On motion, a Committee was appointed, consisting of Messrs. Vaux, LeConte, and Foulke, to make arrangements relative to attendance at the funeral of Dr. E. K. Kane, on the 12th inst. 1857.]

March 17th.

Mr. ASHMEAD in the Chair.

Mr. Ashmead made the following verbal communication regarding specimens of Algæ, presented by him this evening and upon a former occasion:

In the catalogue of Marine Algæ from Key West, which I presented to the Academy last April, there were five undetermined species of the genus *Caulerpa*, and two of *Laurencia*. These, together with some others, supposed to be new, I referred to Prof. Harvey of Trinity College, Dublin.

I received a letter a few days since from that eminent Algologist, giving the true names, which I have attached to the specimens on the table, as follows:

CAULERPA MEXICANA.
C. PLUMIGERA Harvey.
C. PASPALOIDES Bory.
C. SEDOIDES Ag.
C. PLUMARIS Ag.
LAURENCIA IMPLICATA Harvey.
L. GEMMIFERA Harvey.

There were also three species in that catalogue which I erroneously named, viz:

SCINAIA FURCELLATA Bivona, I referred to *HALYMENIA LIGULATA* Ag.
CERAMUM NITENS J. Ag., I had supposed to be *C. RUBRUM* Ag.—and *CRYPTONEMIA CRENULATA* J. Ag., I named, (at the suggestion of Prof. Bailey,) *PHYLOPHORA BROADLEI*.

There is a great similarity in the external habit of these plants, yet they are well distinguished by the internal structure of the frond, to which I had not applied the microscope.

In addition to my former catalogue, which is now corrected, I present this evening

TURBINARIA VULGARIS, var. β . *DECURRENS* Boryg.

This plant is interesting as an addition to our Marine Flora. It was known to occur in the West Indies, but had not been detected on our shores, until I found it at Key West.

DASYA HARVEYI Ashmead.

This is a new *Dasya*; I obtained it at Key West with both kinds of fruit. Prof. Harvey says, "This species is quite new to me, and I feel much gratified by the compliment you pay me, by naming it *D. Harveyi*."

CHOUDRIA ATTROPURPUREA Harvey.

C. SEDIFOLIA Harvey.

LAURENCIA PAPILLOSA Greves.

L. CERVICORNIS Harvey.

CERAMUM TENUISSIMUM Lyngb.

GRACILARIA ARMATA J. Ag.

TONABIA LOBATA Ag.

CAULERPA ASHMEADII Harvey.

In regard to this species, Prof. Harvey makes the following remarks: "As far as I at present know, it is nondescript—but it is not new to me, for I found it myself at Key West, but did not find it growing. It is a very remarkable species, differing from those of similar habit, in its greater size, and in the extreme obtuseness of the pinnæ."

Of this rare species I found but one plant. It was growing in company with *Caulerpa plumaris*, under the bridge leading to Fort Taylor, in a shady position, and where it was sheltered from the action of the waves. Its fibrous roots penetrated the coral sand for a considerable extent, from which a number of fronds sprung up at intervals. I collected every fragment I could find.

[Marsh,

March 24th.

Vice President BRIDGES in the Chair.

The following communications were presented for publication in the Proceedings.

1. Synopsis of the species of *Clivina* and allied genera inhabiting the United States, by John L. LeConte, M. D.

2. Investigation of the Rock Guano of the Islands of the Caribbean Sea, by W. J. Taylor.

3. Description of six new species of *Unio* from Alabama, by Isaac Lea.

4. Description of eight new species of *Naiades*, from various parts of the United States, by Isaac Lea.

5. Description of three new exotic species of *Naiades*, by Isaac Lea.

6. List of Extinct Vertebrata, the remains of which have been discovered in the region of the Missouri, with remarks upon their geological age, by Joseph Leidy, M. D.

And were respectively referred to Committees.

Mr. Cassin announced the death of Mr. JOHN A. GUXE, late a member of the Academy, and alluded to the enthusiasm of Mr. Guex as an entomologist, and to his distinguished liberality in adding to the museum of the Academy his magnificent collection of Coleoptera.

March 31st.

Vice President BRIDGES in the Chair.

The following papers on report of the Committees to which they were referred, were ordered for publication in the Journal.

On the Caducibranchiate Urodele Batrachians, by Edward Hallowell, M. D.

On *Trignophrys rugiceps*, by Edward Hallowell, M. D.

And the following for publication in the Proceedings.

Synopsis of the species *CLIVINA* and allied genera inhabiting the United States.

BY JOHN L. LECONTE, M. D.*

DYSCHIRIUS Bon.

A. Elytra stria vel interstitio 3io tripunctato.

A. Epistoma bisinuatum; elytra stria basali integra.

a. clypeo tridentato;

•18, Antennis nigris, thorace globoso, elytrorum striis integris

1. tridentatus Lec.

b. clypeo dente intermedio obsoleto, lateralibus acutis;

•14, Antennis pedibusque nigerrimis

2. patruelis Lec.

•13, Antennis basi, pedibusque posterioribus rufis

3. basalis Lec.

(•13, Pedibus antennisque brunneis, his basi testaceis, thorace antice angustato,

4. Dejeanii Putz.

* The species which I have not seen are enclosed in a bracket; in some instances I have not been able to discover their characters from the description.

B. Epistoma late emarginatum, bidentatum; elytra stria basali nulla.

c. Frons transversim leviter vel vix impressa;

(elytra striis postice exaratis;)

- | | |
|--|----------------------------|
| ·12, Thorace subtransverso; pedibus subnigris | 5. integer <i>Lec.</i> |
| ·12, Thorace minore globoso; pedibus nigris | 6. nigripes <i>Lec.</i> |
| ·13, Thorace minore globoso; elytris striis profundis fortiter punctatis; pedibus nigris | 7. consobrinus <i>Lec.</i> |
| ·15, Thorace globoso; elytris striis tenuibus parcius punctatis, pone basin impressis | 8. gibbipennis <i>Lec.</i> |

d. Frons transversim sulco impressa;

§. striis elytrorum ad basin extensis, postice oblitteratis;

- | | |
|--|-----------------------------|
| ·15, Thorace globoso; elytris striis tenuibus, antennis pedibusque nigris | 9. æneolus <i>Lec.</i> |
| ·11, Thorace globoso; elytris striis fortioribus, antennarum basi pedibusque rufis | 10. longulus <i>Lec.</i> |
| ·09—12, Thorace transverso, ovato; antennis pedibusque rufis | 11. globulosus <i>Putz.</i> |

§§. striis elytrorum antice abbreviatis; antennis pedibus elytrorumque apice rufis.

α. striis postice oblitteratis;

- | | |
|--|---------------------------------|
| ·13, Thorace transverso ovato; elytris striis fortiter punctatis | 12. hæmorrhoidalis <i>Putz.</i> |
| ·13, Thorace quadrato-globoso; elytris striis leviter punctatis | 13. terminatus <i>Lec.</i> |

β. striis integris;

- | | |
|--|------------------------|
| ·12, Thorace quadrato-globoso; elytris striis fortiter punctatis | 14. analis <i>Lec.</i> |
|--|------------------------|

B. Elytra interstitio 3io bipunctato, vel impunctato, ad basin haud marginato.

A. Tibiis anticis extrorsum haud vel vix dentatis;

a. Ænei, capite lævi, nitido; pedibus rufis.

§ Striis elytrorum integris profundis.

- | | |
|--|-------------------------------|
| ·22, Clypeo bisinuato tridentato | 15. sphæricollis <i>Putz.</i> |
| (·28, Clypeo emarginato, bidentato, thorace elongato, antice valde angustato | 16. edentulus <i>Putz.</i> |

§§ Striis elytrorum nonnullis antice abbreviatis.

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|--|------------------------------|
| ·22, Clypeo truncato; thorace ovato, transverso | 17. truncatus <i>Lec.</i> |
| ·20, Clypeo truncato; thorace ovali, haud transverso | 18. erythrocerus <i>Lec.</i> |

b. Testacei vel rufi, capite rugoso, opaco, elytris pallidis macula communi obscura.

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|---|------------------------------|
| ·18, Clypeo bidentato; thorace rotundato, subtransverso | 19. sellatus <i>Lec.</i> |
| ·14, Clypeo vix bidentato; thorace trapezoideo, oblongo | 20. pallipennis <i>Putz.</i> |

B. Tibiis anticis extrorsum dentatis; stria 8va postice exarata.

§ Striis elytrorum profundis integris.

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|---|------------------------------|
| (·12, Ferrugineus; tibiis anticis calcari terminali valde curvata | 21. curvispinus <i>Putz.</i> |
|---|------------------------------|

§§ Striis elytrorum antice abbreviatis; (nigro-ænei, pedibus rufis.)

- | | |
|--|----------------------------|
| ·14, Valde elongatus; elytrorum striis postice haud oblitteratis; clypeo acute bidentato | 22. filiformis <i>Lec.</i> |
|--|----------------------------|

- (12, Thorace oblongo, elytrorum striis postice subobliteratis 23. *sublævis* Putz.
 - 14, Thorace ovato, elytrorum striis postice subobliteratis; clypeo parum dentato 24. *dentiger* Lec.
 - 12, Thorace ovato, elytrorum striis postice oblitteratis; clypeo acute bidentato 25. *aratus* Lec.
 - 11, Thorace ovali, elytrorum striis postice oblitteratis; clypeo truncato 26. *rufiventris* Lec.
- C. Elytra interstitiis 3io, 5to, et 7mo punctis setiferis uniseriatis.
- 12, Thorace breviter ovato, elytris striis vix impressis postice oblitteratis 27. *setosus* Lec.
 - 14, Thorace globoso, elytris striis impressis, internis subintegris 28. *pilosus* Lec.

Two species from Russian America, *D. transmarinus* Mann. and *D. frigidus* Mann. Bull. Mosc. 1853, Nos. 11 and 12, appear quite distinct from any above described, but the characters given are not such as enable me to place them in the table.

1. *D. convexus* Lec. Ann. Lyc. 5, 195, is a variety of *D. tridentatus* with more flattened elytral intervals.

6. *D. apicalis* ||Lec. Agass. Lake Sup. 204, is changed to *D. nigripes* Lec. Trans. Am. Phil. Soc. 10, 396.

10. *D. pumilus* Putz. is perhaps *D. longulus* Lec., but the description is hardly sufficient.

11. *D. parvus* Lec. Agass. Lac. Sup. 204, is merely a small variety of *D. globulosus*.

3. *D. basalis*, nigro-æneus, nitidus, clypeo trilobato, lobo medio brevior obtuso, vertice subtilissime cristato, thorace globoso, elytris thorace sublationibus, striis antice punctatis, postice integris, ad apicem exaratis, marginali per basin continuata, interstitio 3io tripunctato, antennis fuscis, basi pedibusque rufis, tibiis anticis dente inferiore acuto, superiore minuto. Long. 13.

Fort Yuma, Colorado River, California. This species has the form, size and sculpture of *D. integer* Lec., from the same locality, but differs by the more globose thorax, and trilobed clypeus; the anterior thighs of *D. integer* are also nearly black, while in the present they are dark red. The marginal stria in *D. integer* ceases at the humerus: in the present it is distinctly continued along the base: the dorsal striæ do not completely attain the anterior declivity, they are punctured behind the middle, then smooth to the tip; although not deep they are entire, and the first, second, seventh and eighth, are deeper at the apex: the eighth is obliterated for the rest of its course as usual. The upper tooth of the anterior tibiæ is very small, the second one is prominent, the terminal is as long as the terminal spur, and both are slightly curved.

8. *D. gibbipennis*, elongatus nigro-æneus pernitidus, clypeo late emarginato, angulis prominulis, fronte transversim paulo impressa, et dein plica parva brevissima notata, thorace latitudine haud brevior, globoso, elytris tripunctatis, pone basin impressis, striis punctatis haud impressis, externis postice exaratis, antennarum basi pedibusque obscure rufis, tibiis anticis bidenticulatis. Long. 15.

One specimen found at San Diego, California. More robust than *D. terminatus*, but more slender than *D. globulosus*, having about the proportions of *D. nigripes* Lec. Black, more bronzed than usual, and very shining; head with deep frontal impressions, and a slight transverse line in front of the eyes, which connects with an almost imperceptible medial fold: clypeus broadly emarginate, truncate at the middle, with the angles distinct, not very acute; lateral margin lobed, as usual. Palpi and antennæ piceous, the latter obscure rufous at the base. Thorax almost exactly globose, slightly truncate in front, anterior trans-1857.]

verse impression deep, dorsal line very fine. Elytra slightly wider than the thorax, not quite twice as long as their width, convex; near the suture, toward the base, the surface is more convex, and this convexity is followed by a deep impression near the suture, about the anterior fourth: the striæ are punctured but not impressed, they become obsolete at the latter fourth, and impressed at their terminations, but the seventh and eighth are sinuate and impressed behind to the very apex; the tip of the third is not impressed: the marginal ceases at the humerus: the first, fourth and fifth commence at the declivity of the base, the others are a little shorter; the intervals are entirely flat and the third is tripunctate. The legs are very dark rufous; the anterior tibiæ are armed externally with a small denticle, and an acute tooth; the apical tooth is long and curved, the inferior spur is one-third shorter, and slightly curved.

17. *D. truncatus*, nigro-æneus, nitidus, clypeo truncato, vix emarginato, fronte transversim haud profunde impressa, thorace latitudine subbreuiore, ovato antrorsum angustato, elytris striis impressis antice punctatis, 3ia haud distincte bipunctata, 8va obsoleta, ad apicem exarata, interstitiis planis, palpis pedibusque ferrugineis, antennis piceis ad basin ferrugineis, tibiis anticis vix denticulatis. Long. .22.

One specimen, Illinois, Mr. Wilcox. Of the same size as *D. sphæricollis*, but more robust, and known at once by the ovate thorax and almost squarely truncate clypeus. Blackish bronzed, shining: head with deep frontal impressions, transverse line not profound: clypeus almost truncate with the angles rounded not prominent; sides lobed as usual: antennæ rufo-piceous, with the base red. Palpi and mouth reddish. Thorax a little broader than long, ovate, narrowed in front; dorsal line and transverse anterior impression deep. Elytra not wider than the thorax, less than twice as long as their width, convex: striæ impressed and entire, the first, fourth and fifth commence on the declivity of the base, the others are a little shorter, the eighth is obsolete and represented by only a few punctures, but is deep at the tip: the punctures are moderately large and extend a little beyond the middle; the marginal stria ends at the humerus: the interstices are flat, and in contact with the third stria may be seen two hardly distinct dorsal punctures. The body beneath is black; the legs are dark red; the anterior tibiæ have hardly a trace of external denticles, the terminal tooth is long and gradually curved, the terminal spur is shorter and slightly curved.

18. *D. erythrocerus*, elongatus, æneo-niger, nitidus, clypeo fere truncato, vix emarginato, angulis parum prominulis, fronte transversim impressa, thorace latitudine longiore, subovato, elytris striis impressis, ad basin abbreviatis antice fortiter punctatis, 8va obsoleta ad apicem exarata, interstitiis fere planis, antennis palpis pedibusque rufis, tibiis anticis vix denticulatis. Long. .20.

Ohio. Dr. Schaum: Pennsylvania, Haldeman. Differs from the preceding by the more slender form, deeper transverse frontal impression, and pale antennæ.

19. *D. sellatus*, piceo-rufus, nitidus, clypeo late emarginato, acute bidentato, fronte transversim impresso, capite granulato rugoso, thorace convexo, latitudine paulo brevior, ovato, elytris cylindricis convexis, pallidis, umbra scutellari alteraque communi pone medium obscuratis, antennis pedibusque testaceis. Long. .18.

Found at Atlantic City, on the coast of New Jersey; allied to *D. pallipennis* Putz. (*Clivina pallipennis* Say) but is much larger, and more robust, with a more globose and slightly transverse thorax, and more strongly bidentate clypeus.

22. *D. filiformis*, æneo-niger, nitidus valde elongatus, clypeo late emarginato bidentato, fronte transversim impressa, thorace latitudine haud brevior, quadratim ovato, convexo, antrorsum subangustato, elytris cylindricis, striis antice fortiter punctatis, postice fere integris, ad apicem breviter exaratis, abdomine postice, antennis pedibusque testaceis, tibiis anticis dente inferiore elongato, superiore minuto. Long. .14.

Coney Island, near New York, in salt marsh. Quite as slender as *D. ter-*
[March,

minatus Lec. shining brassy black. Head with clypeus broadly emarginate, and acutely bidentate, front with a deep transverse line: antennæ testaceous, mouth reddish. Thorax not wider than long, subquadrate ovate, sides not converging much in front, convex, anterior transverse impression feeble, dorsal line entire, fine. Elytra not wider than the thorax, twice as long as their width, cylindrical: striæ commencing behind the anterior declivity of the base, strongly but distantly punctured nearly to the middle, the inner ones are then deep and impunctured nearly to the tip, where they are less deep, but at the extreme tip are again deeply impressed as in many other species: the interstices are convex, the third not punctured: the outer striæ are less deep, and the eighth is almost effaced: the marginal ceases at the humerus. The abdomen is rufescent, paler towards the tip: the legs are testaceous, the anterior tibiæ are armed externally with two teeth, the upper very small, the lower acute and prominent: the terminal tooth is long and slightly curved, the inferior spur is not longer than the tooth, but is more curved.

24. *D. dentiger*, elongatus, nigro-æneus nitidus, clypeo late emarginato angulis prominulis, fronte transversim paulo impresso; thorace latitudine vix brevior, antrosum angustato, subgloboso, elytris striis punctatis, postice parum oblitteratis, internis antice abbreviatis; stria basali transversa nulla, apicali unica brevi exarata; antennis pedibusque rufo-testaceis, tibiis anticis dente externo longo armatis. Long. .14.

New York and Pennsylvania. More stout than *D. terminatus* and filiformis, but more elongate than usual. Blackish brassy, shining: head smooth with deep frontal impressions connected between the antennæ by a deep transverse line: clypeus broadly emarginate, with the angles prominent, but not very acute. Antennæ reddish testaceous. Thorax slightly broader than long, narrowed in front, subtrapezoidal, very much rounded behind, and convex, dorsal line and anterior transverse impression well marked. Elytra hardly wider than the thorax, about twice as long as the width, cylindrical, convex: striæ seven upon each, which are tolerably deep towards the base, but very fine and almost obliterated at the apex: the punctures are large and extend to about the middle: the marginal stria ceases at the shoulder, and the four interior striæ do not reach the declivity of the base. The under surface is black, and the legs are ferruginous: the anterior tibiæ are armed externally with a strong tooth near the apex, the upper denticle is obsolete, the apical tooth is long and curved: the interior apical spur is still longer and more curved.

26. *D. rufiventris*, nigro-æneus, nitidus, clypeo truncato, fronte transversim haud impressa, thorace latitudine haud brevior, ovali, antrosum paulo angustato, elytris striis antice fortiter punctatis postice exaratis, ore abdomineque rufis antennis fuscis ad basin pedibusque testaceis, tibiis anticis dente inferiore acuto armatis. Long. .11.

One specimen from Louisiana given me by Dr. Schaum. In the proportions of the body, and sculpture of the elytra this species resembles *D. haemorroidalis*, but the other characters are very different. The upper denticle of the anterior tibiæ is very small, the lower one is acute and prominent, the terminal tooth is long and curved, but the inferior spur is yet longer and more curved. The striæ of the elytra do not extend upon the anterior declivity; they are very strongly punctured to the middle, and then become gradually obliterated to the tip, when the first, second and seventh are slightly impressed: the eighth stria is obliterated and the marginal ceases at the humerus: the interstices are convex, and the third are without punctures.

27. *D. setosus*, æneo-niger, nitidus, clypeo emarginato, bidentato, fronte transversim impressa, thorace latitudine brevior, ovato, trapezoideo, elytris convexis, grosse seriatim punctatis, postice lævigatis, interstitiis alternis punctis minutis setiferis uniseriatis notatis, antennis pedibusque testaceis, tibiis anticis dente inferiore acuto, superiore vix distincto. Long. .12.

Massachusetts and New York, in salt marsh. A very curious species, more robust than usual and having nearly the proportions of *D. globulosus*. 1857.]

The rows of large punctures on the elytra, which represent the striæ cease behind the middle, and at the tip only the extremity of the seventh stria is exarate: the rows of small interstitial punctures are four and extend nearly to the tip: each of them supports a long erect black hair, as in *Bembidium laevigatum*, and other long hairs are seen at the margin of the thorax. The anterior tibiæ have a scarcely distinct superior denticle, and an acute inferior tooth: the apical tooth is long and slightly curved, the spur is nearly as long and curved.

28. *D. pilosus*, æneo-niger, nitidus, clypeo emarginato, bidentato, fronte transversim impresso, thorace latitudine haud brevior, quadrato-globoso, elytris convexis, striis integris antice profundis et fortiter punctatis, interstitiis lmo, 3io, 5to, 7moque parce uniseriatim punctatis et setosis, ano, ore, antennis pedibusque testaceis, tibiis anticis dente inferiore acuto, superiore vix distincto. Long. .14.

New Orleans, Dr. Schaum. Allied to the preceding, but larger and less robust; the thorax is different in form and not at all transverse: the striæ of the elytra are impressed, and the inner ones may be traced to the very tip: the outer ones are obliterated, the eighth is entirely wanting: the marginal ceases at the humerus: the seventh is exarate at the tip as in the preceding. The anterior tibiæ are as in the preceding. A few long hairs are seen at the margin of the head and thorax, as in *D. setosus*.

ACEPHORUS Lec.

- 25, *Testaceus*, subnitidus, elytris subtiliter striatis, macula parva communis fusca notatis. 1. *marinus* Lec.

ARDISTOMIS Putz.

A. Elytra striata, glabra.

- 32, *Nigra*, antennis, pedibus, elytrorum macula utrinque postica rubris 1. *obliquata* Putz.
 ·22, *Nigra*, antennis pedibusque piceis, elytris interstitio 3io 5-punctato 2. *Schaumii* Lec.

B. Elytra seriatim punctata, punctis setiferis.

- 23, *Nigro-viridis*, antennis pedibusque rufis, thorace margine punctato 3. *viridis* Lec.
 ·23, *Nigro-viridis*, antennis pedibusque rufis, thorace disco parce punctato 4. *puncticollis* Putz.

2. *A. Schaumii*, niger nitidus, capite angusto, thorace ovato, latitudine vix brevior, antrorsum valde angustato, elytris subvirescentibus, striatis, interstitiis parum convexis, 3io quinquepunctato, palpis testaceis, antennis pedibusque obscure rufo-piceis. Long. .22.

Louisiana, very rare: given me by my excellent friend Dr. Schaum, to whom it is dedicated. This species has the form and sculpture of *A. obliquata*, but is smaller, with less convex elytral intervals, and only five dorsal punctures.

3. *Clivina viridis* Say; *Clivina rostrata* Dej.; *Ardistomis rostrata* Putzeys; *Ardistomis vicina* Putzeys.

ASPIDOGLOSSA Putz.

Of this genus is known to me but one species within our territory, *A. subangulata* Lec., which however varies slightly in the form of the thorax, so as to account for the list of synonyms, which are as follows:

Dyschirius subangulatus Chaud.; *Clivina crenata* Dej.; *Clivina bipustulata* Say.; *Dyschirius humeralis* Chaud.; *Aspidoglossa vicina* Putzeys; *Aspidoglossa fraterna* Putzeys.

[March

OLIVINA Latr.

A. Tibiæ intermediæ extrorsum versus apicem calcaratæ; clypeus ad latera lobatus; (elytra punctis dorsalibus pluribus.)

a. Femora antica versus apicem dentata; paronychio valde elongato.

‡. Tibiæ anticæ longitudinaliter sulcatæ;

Thorace planiusculo, latitudine fere breviorē;

- | | |
|---|-------------------|
| ·33, Capite puncto verticali distincto | 1. corvina Putz. |
| ·3, Capite puncto verticali obsoleto | 2. confusa Lec. |
| ·32, Thorace latitudine longiore, cylindrico; capite puncto verticali nullo | 3. georgiana Lec. |

(‡‡. Tibiæ anticæ haud impressæ;

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|-------|-------------------|
| (·30, | 4. dentipes Dej. |
| (·35, | 5. fissipes Putz. |

b. Femora antica mutica, incrassata; paronychio elongato.

‡. Vertex sulcatum;

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|---|-----------------------|
| ·26, Capite lævi; tota rufa | 7. impressifrons Lec. |
| ·24, Capite punctulato; thorace lævi; tota rufa, depressiuscula | 8. planicollis Lec. |
| ·21, Capite thoraceque punctulatis; tota rufa | 9. punctulata Lec. |
| ·21, Capite thoraceque punctulatis; picea | 10. punctigera Lec. |

‡‡. Vertex haud sulcatum; caput thoraxque lævia;

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|---|--------------------|
| ·21, Vertice foveato; thorace angulis basalibus dentigeris; tota rufa, depressiuscula | 11. rubicunda Lec. |
| ·20, Vertice haud foveato; thorace angulis basalibus simplicibus; tota fusco-rufa | 12. rufescens Dej. |

B. Tibiæ intermediæ extrorsum haud calcaratæ.

a. Clypeus ad latera lobatus; elytra punctis dorsalibus pluribus; femora antica subtus versus apicem profunde sinuata; paronychio elongato; (frons foveata;)

‡. Elytris striis integris subtilius punctulatis;

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| ·20, Tota rufa | 13. rufa Lec. |
| ·21, Rufa, sutura late nigricante | 14. Randalli Lec. |
| (·19, Nigra antennis pedibusque testaceis, elytrorum margine externo suturaque extrema ferrugineis | 15. analis Putz. |
| ·24, Nigra, pedibus rufo-piceis, antennis rufis | 16. americana Dej. |

‡‡. Elytris striis postice oblitteratis; nigra, antennis rufis;

- | | |
|--|--------------------------|
| ·18, Thorace quadrato, elytrorum striis postice paulo oblitteratis | 17. morula Lec. |
| ·25—·21, Thorace ovato, elytrorum striis postice paulo oblitteratis | 18. cordata Putz. |
| (·32, Thorace globoso-ovato, elytrorum striis postice valde oblitteratis | 19. morio Dej. |
| ·20, Thorace subquadrato, antice angustato, vage punctulato (paronychio breviusculo) | 20. striatopunctata Dej. |

b. Clypeus ad latera rotundatus; elytra punctis dorsalibus binis vel nullis; femora antica incrassata, subtus haud sinuata; paronychio brevi, vel nullo.

‡. Vertex longitudinaliter sulcatum;

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|-----------------------------|-----------------|
| ·21, Rufa, thorace elongato | 21. ferrea Lec. |
|-----------------------------|-----------------|

22. Vertex haud vel vix obsoleta sulcatum ;
 a. Tibiæ anticæ dente laterali unico, terminali rectangulariter flexo;
 20, Nigra, elytris maculatis; thorace vage punctu-
 lato; paronychio subtilissimo 22. convexa *Lec.*
 ß. Tibiæ anticæ dentibus lateralibus duabus, dente terminali sen-
 sim curvata ;
 23—30, Nigra elytris maculatis; thorace fere lævi;
 paronychio nullo 23. bipustulata *Dej.*
 (27, Nigra, elytrorum margine suturaque postica fer-
 rugineis; thorace lævi 24. marginipennis *Putz.*
 21, Nigra elytris maculatis; thorace punctato; pa-
 ronychio brevi 25. postica *Lec.*
 21, Nigra; sulco frontali transverso profundo; tho-
 race vage punctato; paronychio brevi 26. picea *Putz.*
 (20, Nigra elytris maculatis; thorace lævi 27. stigmula *Putz.*

The species 1—3 are so closely related that they might perhaps be regarded, with some Mexican and South American forms, as races of one species; 4 and 5 perhaps may belong with them, but as Putzeys mentions particularly that the anterior tibiæ are not longitudinally impressed, I have retained them in the table.

8. *C. planicolis*. South Carolina, sent me by Dr. Zimmermann.
 10. *C. punctigera*. Found with the preceding.
 11. *C. rubicunda*. Louisiana, Dr. Schaum.
 12. *C. rufescens* Dej. is perhaps *C. pallida* Say, but the color is darker than described by Say; none of the other species mentioned in the synopsis can be referred to Say's description; *C. rubicunda* has the proper color and form, but besides the lateral angle, the basal angles are tooth-like.
 13. *C. rufa*. Illinois, Mr. Willcox.
 14. *C. Randalli*. *Clivina elongata* || Randall. The specimen is very imperfect, but seems most allied in sculpture to *C. americana*. The head is wanting.
 16. *C. americana* Dej.; *Clivina acuducta* Hald., according to comparison with the type. This and the two species which follow it are very closely allied; the only differences observed are those mentioned in the table.
 21. *C. ferrea*. Illinois, Mr. Willcox; Catskill, Mr. H. Ulke.
 22. *C. convexa* is probably *C. bisignata* Putzeys, though the peculiar form of the terminal digitation of the anterior tibiæ is not mentioned.
 23. *C. bipustulata*. *Scarites quadrimaculatus* Beauv.
C. picipes Bon.; Putzeys, 105, is probably not found in the United States. It is very different from any above mentioned.
Scarites attenuatus Herbat. Käfer, 10, 264, tab. 176, f. 7, is completely irreco-
 gnizable.

SCHIZOGENIUS Putz.

- A. Mentum edentatum, lobis recte truncatis; elytra crenato-striata, inter-
 stitio 5to haud punctato;
 17, Nigro-rufus, cylindricus; elytris interstitio 3io
 tripunctato 1. crenulatus *Lec.*
 B. Mentum medio dentatum, lobis oblique emarginatis; elytra interstitio
 5to punctigero.
 a. Elytra striis punctatis;
 19, Nigro-rufus, elytris subdepressis, striis dense
 punctatis 2. lineolatus *Lec.*
 16, Rufus, elytris cylindricis, striis minus profunde
 punctatis 3. ferrugineus *Putz.*

[March,

- 15, Rufus, elytris valde depressis; thorace angulis ante basin prominulis 4. *amphibius* Lec.
 ·16, Obscure rufus, elytris valde depressis; thoracis angulis haud prominulis 5. *depressus* Lec.
 b. Elytra striis impunctatis;
 ·17, Rufo-niger, elytris subdepressis, interstitiis alternis multipunctatis setigeris 6. *pluripunctatus* Lec.
2. *Clivina lineolata* Say; *Schizogenius sulcifrons* Putzeys.
 3. *S. ferrugineus* Putzeys; *Clivina sulcata* Lec.
 4. *Clivina amphibia* Hald.; *Clivina frontalis* Lec.
 6. *S. pluripunctatus* Lec.; *S. simplex* Lec.

Description of Six New Species of UNIONES from Alabama.

BY ISAAC LEA.

UNIO PROPINQUUS. Testâ subnodulosâ, obliquâ, subtriangulari, valdè inæquilaterali, ad latere sulcatâ; valvulis crassis, anticè crassioribus; natibus erectis, tumidis; epidermide luteo-olivaceâ, valdè radiatâ; dentibus cardinalibus subgrandibus, in utroque valvulo duplicibus; lateralibus percrassis, crenulatis, curtis subcurvisque; margaritâ albâ et iridescente.

Hab. Florence, Alabama, Rev. G. White and Tuscumbia, Alab., L. B. Thornton, Esq.

UNIO FLORENTINUS. Testâ lævi, ellipticâ, subæquilaterali, ad latere paulisper planulatâ; valvulis crassis, anticè crassioribus; natibus tumidis, ad apices undulatis; epidermide luteo-olivaceâ, valdè radiatâ; dentibus cardinalibus submagnis, conicis, crenulatis, in utroque valvulo duplicibus; lateralibus curtis, subcurvisque; margaritâ albâ.

Hab. Florence, Alabama. Rev. G. White. Cumberland River, Tenn., Drs. Troost and Edgar, and T. C. Downie, Esq., St. Simon's Island.

UNIO BIEMARGINATUS. Testâ lævi, triangulari, inæquilaterali, posticè biangulatâ, ad latere sulcatâ, ad basim et posticè emarginatâ; valvulis sub-crassis, anticè crassioribus; natibus prominentibus, compressis; epidermide rufo-fuscâ valdè radiatâ; dentibus cardinalibus parvis, valdè crenulatis, sub-conicis, in utroque valvulo duplicibus; lateralibus curtis, crassis rectisque; margaritâ albâ et iridescente.

Hab. Florence, Alab. Rev. G. White.

UNIO MUNDUS. Testâ lævi, obliquâ, tumidâ, posticè subangulatâ, valdè inæquilaterali; valvulis crassis, anticè crassioribus; natibus valdè elevatis, tumidis, retrorsis; epidermide vel luteâ vel luteo-fuscâ, maculatâ; dentibus cardinalibus parvis, crenulatis, compresso-conicis; lateralibus; sublongis, crassis subcurvisque; margaritâ albâ et iridescente.

Hab. Tuscumbia, Alab. L. B. Thornton, Esq.

UNIO THORNTONII. Testâ lævi, subrotundâ tumidâ, ad latere paulisper planulatâ, ad basim compressâ, valdè inæquilaterali, anticè et posticè rotundatâ; valvulis crassis; natibus valdè elevatis, tumidis, retrorsis; epidermide rufo-fuscâ, maculatâ; dentibus cardinalibus crassis crenulatisque; lateralibus percrassis subcurvisque; margaritâ albâ et iridescente.

Hab. Tuscumbia, Alab. L. B. Thornton, Esq.

UNIO MOORESIANUS. Testâ lævi, subtriangulari, tumidâ, ad latere planulatâ, ad basim compressâ, posticè subangulatâ, valdè inæquilaterali; valvulis crassis, anticè crassioribus; natibus valdè elevatis, tumidis, retrorsis; epidermide rufo-fuscâ, maculatâ; dentibus cardinalibus crassis, obtuso-conicis, crenulatis, in utroque valvulo duplicibus; lateralibus crassis subrectisque; margaritâ albâ et iridescente.

Hab. Tuscumbia, Alabama. H. Moores.
 1857.]

Description of Eight New Species of *NAIADES* from various parts of the United States.

BY ISAAC LEA.

UNIO PINGUIS. Testâ lævi, ellipticâ, inflatâ, valdè inæquilaterali; valvulis subcrassis; natibus prominentibus, retrorsis; epidermide luteâ, obscurè radiatâ et politâ; dentibus cardinalibus submagnis, duplicis, acuminatis crenulatisque; lateralibus magnis, lamellatis longis curvisque; margaritâ albâ et indescente.

Hab. St. Peter's River, Upper Mississippi. B. W. Budd, M.D.

UNIO HIGGINSII. Testâ lævi, obliquâ, ventricosâ, valdè inæquilaterali, anticè rotundatâ; valvulis percrassis; natibus valdè prominentibus, tumidis incurvisque; epidermide virido-olivâ, politâ, valdè radiatâ; dentibus cardinalibus magnis, crassis, erectis, crenulatis, in utroque valvulo duplicibus; lateralibus sublongis, percrassis subrectisque; margaritâ vel albâ vel salmonis colore tinctâ.

Hab. Muscatine, Iowa. Frank Higgins.

UNIO ABBEVILLENSIS. Testâ lævi, oblongâ, subinflatâ, ad lateris planulatis, valdè inæquilaterali, posticè biangulatâ; valvulis crassis; natibus prominulis; epidermide brunneâ, striatâ; dentibus cardinalibus magnis, crassis, in utroque valvulo duplicibus; lateralibus prælongis, lamellatis subcurvisque; margaritâ vel albâ vel salmonis colore tinctâ.

Hab. Abbeville District, South Carolina. Dr. Barratt.

UNIO JAMESIANUS. Testâ lævi, ellipticâ, compressâ, valdè inæquilaterali, posticè valdè compressâ ad basim emarginatâ; valvulis subcrassis; natibus prominulis, ad apicem centraliter undulatâ; epidermide luteâ, politâ; dentibus cardinalibus compressis, crenulatis; lateralibus longis, lamellatis valdè curvisque; margaritâ albâ et iridescente.

Hab. Jackson, Mississippi. U. P. James.

UNIO TEXASIENSIS. Testâ lævi, ellipticâ, subcompressâ, valdè inæquilaterali, posticè subangulatâ; valvulis subtenuibus, anticè crassioribus; natibus prominulis, ad apices pereleganter et concentricè undulatis; epidermide tenebroso-olivâ, politâ, obsoletè radiatâ; dentibus cardinalibus parvis, compressis, erectis crenulatisque; lateralibus longis, lamellatis subcurvisque; margaritâ cœruleâ et valdè iridescente.

Hab. Dewitt County, Texas. W. Newcomb, M. D.

ANODONTA LEWISII. Testâ lævi, ellipticâ, subventricosâ, inæquilaterali, posticè obtusè angulatâ, anticè rotundatâ; valvulis subtenuibus; natibus prominulis, ad apices rugoso-undulatis; epidermide tenebroso-olivaceâ, eradiatâ; margaritâ cœruleo-albâ et iridescente.

Hab. Erie Canal and Mohawk River, Herkimer Co., N. Y. James Lewis, M. D.: and Genesee River, below Rochester. Prof. C. Dewey.

ANODONTA LACUSTRIS. Testâ lævi, transversâ, subinflatâ, valdè inæquilaterali posticè subangulatâ; valvulis tenuibus; natibus prominulis, ad apices crebri undulatis; epidermide luteo-olivaceâ, eradiatâ, transversè vittatâ; margaritâ vel albâ vel croceâ et iridescente.

Hab. Crooked Lake and Little Lakes, New York. James Lewis, M. D.

ANODONTA MODESTA. Testâ lævi, ellipticâ, subinflatâ, valdè inæquilaterali, subemarginatâ, anticè obtusè angulatâ; valvulis subcrassis, posticè crassioribus; natibus subprominentibus, ad apices undulatis; epidermide olivaceâ, transversè vittatâ et obsoletè radiatâ; margaritâ argenteâ et valdè iridescente.

Hab. Pond near Kalamazoo, Mich. J. Lewis M. D.

[March

Description of Three New Exotic species of *NAIADES*.

BY ISAAC LEA.

UNIO PONYANUS. Testâ lævi, transversâ, subcylindraceâ, ad basim subemarginatâ, valdè inæquilaterali, ad latere planulatâ, posticè truncatâ et subbiangulatâ; valvulis subcrassis; natibus prominulis, ad apices simplicibus; epidermide luteolâ; dentibus cardinalibus subcompressis, acuminate crenulatisque; lateralibus prælongis, lamellatis rectisque; margaritâ luteolâ et iridescente.

Hab. Rio de las Balsas, near Coyucan, Mexico. Prof. Poey of Havanna.

UNIO CANADENSIS. Testâ lævi, triangulari, subcompressâ, inæquilaterali, posticè obtusè angulatâ; valvulis subcrassis, anticè crassioribus; natibus subprominentibus; epidermide luteâ, posticè radiatâ; dentibus cardinalibus parvis, erectis crenulatisque; lateralibus longis, curvis lamellatisque; margaritâ albâ et iridescente.

Hab. St. Lawrence River, near Montreal. M. Carey Lea.

ANODONTA HOLTONIS. Testâ lævi, oblongâ, inflatâ, valdè inæquilaterali, e natibus lineatis; valvulis subcrassis; natibus subprominentibus; epidermide tenebroso-olivaceâ, striatâ; margaritâ cœruleâ et iridescente.

Hab. Near Cauca River, Province of Popayan, S. A. Rev. J. F. Holton.

Description of Twelve New Species of *NAIADES* from North Carolina.

BY ISAAC LEA.

UNIO WHEATLEYI. Testâ lævi, quadratâ, subinflatâ, ad latere planulatâ, subemarginatâ, valdè inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscâ; dentibus cardinalibus curtis, subcrassis, in utroque valvulo duplicibus; lateralibus subcrassis, prælongis subrectisque; marginatâ vel albâ vel purpureâ et iridescente.

Hab. Catawba River, Gaston Co., N. C. C. M. Wheatley.

UNIO PERCOARCTATUS. Testâ lævi, quadratâ, valdè coarctatâ ad latere planulatâ valvulis tenuibus, posticè subbiangulatâ; natibus vix prominentibus, ad apices undulatis; epidermide tenebroso-fuscâ, minutè et valdè striatâ; dentibus cardinalibus parvis, striatis, in utroque valvulo duplicibus; lateralibus prælongis, lamellatis rectisque; margaritâ purpureâ et valde iridescente.

Hab. Catawba River, Gaston Co., N. C. C. M. Wheatley and F. A. Genth, M. D.

UNIO GRACILENTUS. Testâ lævi, valdè transversâ, valdè compressâ, ad latere planulatâ, valdè inæquilaterali, posticè obtusè angulatâ; valvulis tenuibus; natibus vix prominentibus, ad apices undulatis; epidermide tenebroso-fuscâ, posticè obsolete radiatâ; dentibus cardinalibus parvis, crenulatis, in utroque valvulo duplicibus; lateralibus prælongis, lamellatis rectisque; margaritâ cœruleo-albâ et valde iridescente.

Hab. Catawba River, Gaston Co., N. C. C. M. Wheatley.

UNIO MICANS. Testâ lævi, ellipticâ, subcompressâ, valdè inæquilaterali, posticè angulatâ; valvulis subtenuibus, posticè crassioribus; natibus prominulis; epidermide luteo-fuscâ, valdè radiatâ et valdè micante; dentibus cardinalibus parvis, compressis, erectis crenulatisque; lateralibus longis, lamellatis rectisque; margaritâ vel albâ vel salmonis colore tinctâ et valde iridescente.

Hab. Catawba River, Gaston Co., N. C. C. M. Wheatley and F. A. Genth, M. D. Deep River Gulf, N. C. Prof. Emmons.

UNIO GENTHII. Testâ lævi, obliquâ, inflatâ, inæquilaterali, posticè obtusè angulatâ; valvulis subcrassis, anticè crassioribus; natibus prominentibus; epidermide tenebroso-fuscâ, obsolete radiatâ; dentibus cardinalibus subgrandibus, 1857.]

obtusè conicis crenulatisque; lateralibus crassis, curtis rectisque; margaritâ albâ et iridescente.

Hab. Catawba River, Gaston Co., N. C. C. M. Wheatley and F. A. Genth, M. D. Deep River Gulf, N. C. Prof. Emmons.

UNIO EMMONSII. Testâ lævi, transversâ subcompressâ, valdè inæquilaterali, posticè subbiangulatâ, ad latere planulatâ; valvulis subcrassis; natibus vix prominulis, ad apices undulatis, epidermide tenebroso-fuscâ, radiatâ, nitidâ; dentibus cardinalibus subgrandibus, compressis, crenulatis, in utroque valvulo duplicibus; lateralibus prælongis, lamellatis rectisque; margaritâ albâ et iridescente.

Hab. Roanoke River, at Weldon, N. C. Prof. E. Emmons.

UNIO SPADICEUS. Testâ lævi, ellipticâ, subcompressâ, inæquilaterali, posticè subbiangulatâ submarginatâ; valvulis subtenuibus, anticè crassioribus; natibus vix prominulis; epidermide spadiceâ, eradiatâ; dentibus cardinalibus parvis crenulatisque; lateralibus sublongis subrectisque; margaritâ salmonis colore tinctâ et iridescente.

Hab. Deep River, Gulf, N. C. Prof. Emmons: and mountain streams, N. C. Joseph Clark.

UNIO INSULSUS. Testâ lævi, quadratâ, inflatâ, inæquilaterali, posticè obtusè angulatâ, at laterè subplanulatâ; valvulis subcrassis; natibus prominulis, ad apices rugoso-undulatis; epidermide virido-fuscâ, insulse, striatâ, obsoletè radiatâ; dentibus cardinalibus parvisculis, subcompressis, in utroque valvulo duplicibus; lateralibus sublongis subcurvisque; margaritâ vel albâ vel purpureâ et iridescente.

Hab. Roanoke River, Weldon, N. C. Prof. Emmons.

UNIO STRIATULUS. Testâ lævi, triangulari, subinflatâ, subæquilaterali, posticè angulatâ; valvulis subcrassis, anticè crassioribus; natibus elevatis, acuminateis, ad apices rugoso-undulatis; epidermide fuscâ, minutè striatâ, obsoletè radiatâ; dentibus cardinalibus parvulis, subcompressis in utroque valvulo duplicibus crenulatisque; lateralibus brevibus, subcrassia rectisque; margaritâ vel albâ vel croceâ et iridescente.

Hab. Roanoke River, at Weldon N. C. Prof. Emmons.

UNIO MACER. Testâ alatâ, lævi, obovatâ, compressissimâ, valdè inæquilaterali, posticè biangulatâ; valvulis tenuibus; natibus parvis, acuminateis, ad apices undulatis; epidermide fuscâ, nitidâ, valdè radiatâ; dentibus cardinalibus parvis, tuberculatis; lateralibus prælongis, attenuatis, lamellatis subrectisque; margaritâ purpureâ, et iridescente.

Hab. Roanoke River, Weldon, N. C. Prof. Emmons.

UNIO CONTRACTUS. Testâ lævi, ellipticâ, valdè compressâ, valdè inæquilaterali, posticè rubrotundatâ; valvulis tenuibus; natibus depressis, ad apices undulatis; epidermide tenebroso-fuscâ, obsoletè radiatâ; dentibus cardinalibus parvis, tuberculatis; lateralibus longis, lamellatis rectisque; margaritâ vel albâ vel purpureâ et iridescente.

Hab. Roanoke River, Weldon, N. C. Prof. Emmons.

ANODONTA VIRGULATA. Testâ lævi, ellipticâ, ventricosâ, inæquilaterali, posticè obtusè angulatâ; valvulis subtenuibus; natibus prominulis, ad apices undulatis; epidermide vittata, virido-radiatâ; margaritâ cœruleo-albâ et iridescente.

Hab. Roanoke River, Weldon, N. C. Prof. Emmons: and Washington Co., Georgia. Rev. G. White.

[March,

Contributions to the Neuropterology of the United States. No. 1.

BY P. B. UHLER.

NANNOPHYA Rambur.

N. bella. Black, pleura and sides marked with yellow; wings with a saturate pale-ferruginous spot at base enclosing a number of round dots of a darker color.

Length $\frac{3}{4}$ inch. Baltimore. June.

♀. Trophi blackish, front white with a large black spot upon the middle, vertex blue, eyes brown, antennæ black: thorax black with a yellow vitta upon the pleura becoming posteriorly confluent with patches of the same color, interalary surface maculate with yellow: wings hyaline, a broad, saturate yellowish-ferruginous spot at base occupying about one-third of their surface and enclosing a number of small round dots of a deeper color; pterostigma small, black: legs black, spiny: abdomen black annulated with yellow, caudal tip and appendages also yellow.

This beautiful little species, the second only of the genus yet known, differs a little from the type and must be placed in a division which may be characterized by having two ranges of discoidal areolets. It is very rare and the male is yet unknown to me.

LIBELLULA Lin.

1. *L. bistigma*. Lead-blue; wings with a ferruginous tint upon the costal margin, stigma brown and white.

Length 2 inches. Baltimore. June and July.

♂. Body entirely lead blue; eyes brown, trophi dusky; frontal and vertical vesicles dark blue, antennæ black, stemmata brownish: thorax medially with a deep longitudinal depression, a sharp carina occupying the middle: wings lacteo-hyaline, costal margins slightly tinged with ferruginous, sometimes extending narrowly upon the tips, stigma bicolored, half brown and half white, membranes narrow, whitish: legs black, anterior ones dusky at base: abdomen trigonal, carinate, tapering towards the tip, cerci subfusiform, sub-acute.

The female of this species I have not yet been able to discover, notwithstanding it is here very common; I was tempted to suppose it to be a geographical variety of the species following: however as I have not yet heard that doctrine fully elucidated it seems hardly prudent for me to venture any further suggestions upon the subject.

2. *L. plumbea*. Lead color; pleura with two white spots; wings with a tinge of ferruginous upon the costal margin.

Length 2 inches. Baltimore. July.

♂. Body plumbeous: labium, base of mandibles, and sides of nasus and front white; mandibles at tip, labrum, nasus, front and antennæ black; frontal and vertical vesicles dark blue, eyes brown, occiput with two yellow spots behind each eye: pleura each with two common white patches, which are divided by black sutures, dorsolum and metapnystega also white, dorsal middle longitudinally depressed, but slightly carinated: wings hyaline with a ferruginous tinge upon the costal margin, stigma long, brown: abdomen gradually tapering posteriorly, carinate, first and second segments white beneath, caudal segment and appendages black, cerci fusiform, sub-acute.

♀. Body pale brown; head, dorsal line, line between the wings, pleural spots, pectus, sides of tergum and femora, testaceous-yellow; eyes brown, antennæ black: costal margins and tips of the wings ferruginous: abdomen subdepressed, tergum with a gradually dilating brown line upon the middle, antepenultimate segment broadly dilated.

3. *L. confusa*. Fuscous; thorax with two oblique yellow lines up pleura, connected with each of which is a pale trigonal spot; wings with a brown basal line, and medial and apical spot.

Length $1\frac{1}{4}$ inches. Baltimore and Boston.

1857.]

♀. *Fuscous*: head, with the frontal vesicles above, labium and spots upon the occiput yellow, antennæ and connecting line black, eyes brown: pleura with two oblique yellow lines bounding inferiorly a trigonal pale spot, a pale transverse line between the pairs of wings: wings hyaline, at the base a longitudinal line, a spot upon the anterior middle, and another upon the apex, brown, nervules of the spots and intervening surface yellow, pterostigma black: legs pale at base, black upon the tip of the femora and tibia: abdomen brownish, a little depressed, antepenultimate segment a little dilated, a dark line upon the middle, and one each side bright yellow, venter lined with yellow each side, cerci short, subfusiform, acute, inferior appendage same length as cerci.

♂. Differs but little from the ♀ in size and coloring; it may be distinguished from *L. pulchella*, Drury,—to which it is very closely allied—in the lateral yellow vitta and much larger size of the ♀: the male always wants the plumbeous abdomen, which is common to *L. pulchella*.

4. *L. saturata*. Reddish yellow; head —; thorax dark yellowish-red, pale beneath and upon the sides; wings humeral portion saturate reddish-yellow, cubital portion hyaline, nervules red, pterostigma red, margined anteriorly and posteriorly by a black nervule; legs rufous, pale at base, tibial spines black; abdomen slightly dilated, carinate trigonate, lateral edge and denticles black; cerci subfusiform, acuminate, armed with a row of minute tubercles upon the inferior surface, inferior caudal appendage oval, tapering at tip and emarginate.

Length 2 inches. San Diego trip. Dr. T. H. Webb.

This species is indicated by a mutilated individual only; the head and a great part of the wings and legs are gone, and those parts remaining are in so bad a condition as to render it almost uncharacterizable. It apparently belongs to a group having five rows of discoidal areolets; the triangle is crossed by four nervules.

5. *L. Julia*. Fuscous, pubescent; eyes brown, darker below, tips of mandibles, line between the antennæ, antennæ and pubescence upon the front black, front and occipital spots yellowish; thorax with the superior, middle-surface and pleura pale fuscous, humerus with a dark-brown longitudinal line; wings hyaline, posterior pair with a trigonal dark-brown spot at base of each, necks of anterior pair tinged with brown, nervules and pterostigma dark-brown, the latter narrow and a little elongated, membranes narrow whitish; legs with the coxæ, trochanters and bases of femoræ pale reddish-yellow, tibia and tarsi blackish; abdomen sub-depressed, slightly carinate above, line upon the middle of the posterior segments and lateral margin black, caudal appendages yellow, cerci short, subfusiform, minutely, serially, granulate beneath.

Length 1½ inches. Fort Steilacoom, W. Territory. Dr. Suckley.

A species very closely allied to *L. trimaculata* De Geer. It possesses three ranges of discoidal areolets, and the triangle is crossed by only one nervule.

6. *L. assimilata*. Pale-yellow; head yellowish-testaceous, a black line covering the antennal suture, tips of mandibles and antennæ black, front and vertex closely covered with blackish hair; thorax densely pubescent, pectus pale-testaceous; wings hyaline, tinted with yellow upon the base and humeral margin, costal nervule dotted with minute, black points, pterostigma yellow, margined anteriorly and posteriorly, by a black nervule; legs black, coxæ, trochanters and inferior surface of the anterior legs, yellowish; abdomen, almost transparent, yellowish, cerci —.

Length 1½ inches. Fort Union, Nebraska. Dr. Suckley

The three individuals, the only ones that I have had the opportunity of examining, are in such a mutilated condition as to render it very difficult to characterize them properly; enough, however, remains to indicate their distinctness from all the other species that have yet been noticed.

They have three ranges of discoidal areolets to the primary wings, and the triangle is crossed by a single nervule.

The three foregoing insects were kindly placed in my hands by Dr. Chas. Girard, to whom I would embrace this opportunity of returning my thanks.

[March

List of Extinct VERTEBRATA, the remains of which have been discovered in the region of the Missouri river : with remarks on their Geological Age.

BY JOSEPH LEIDY, M. D.

I. MAMMALIA.

RUMINANTIA.

1. OREODON CULBERTSONII, Leidy : Ancient Fauna of Nebraska 45. Synonymes, *Merycoidodon Culbertsonii*, *Oreodon prisus*, *Cotylops speciosa*.
2. OREODON GRACILIS, L. : Ibid. 53. Syn. *Merycoidodon gracilis*.
3. OREODON MAJOR, L. : Ibid. 55 ; Proc. Acad. Nat. Sci. viii. 164. Syn. *Merycoidodon major*.
4. AGRIOCHERUS ANTIQUS, L. : Anc. Fauna Nebr. 24. Syn. ? *Eucrotaphus Jacksoni*.
5. AGRIOCHERUS MAJOR, L. : Proc. Acad. Nat. Sci. viii. 164. Syn. ? *Eucrotaphus auritus*.
6. POEBROTHERIUM WILSONI, L. Anc. F. Nebr. 19.
7. LEPTOMERYX EVANSI, L. : Pr. A. N. S. vi. 394.
8. LEPTAUCHENIA DECORA, L. : Ibid. viii. 88.
9. LEPTAUCHENIA MAJOR, L. : Ibid, 163.
10. PROTOMERYX HALLI, L. : Ibid. 164.
11. MERYCODUS NECATUS, L. : Ibid, vii. 90.
12. CAMELOPS KANSANUS, L. : Jour. A. N. S. iii. 166.

MULTUNGULA.

13. CHORROBOTAMUS (HYOPOTAMUS) AMERICANUS, L. : Pr. A. N. S. viii. 59.
14. ENTELODON MORTONI, L. : Anc. F. Nebr. 57. Syn. *Archæotherium Mortoni*, *A. robustum*, *Arctodon*.
15. ENTELODON INGENS, L. : Pr. A. N. S. viii. 164.
16. TITANOTHERIUM PROUTHI, L. : Anc. F. Nebr. 72 ; Pr. A. N. S. viii. 92. Syn. *Palæotherium* Cuv. Prout ; P? *Proutii*, Owen, Norwood, and Evans ; *Rhinoceros* ? *americanus* ; *Eotherium americanum*, and *Palæotherium giganteum*, Leidy.
17. PALÆOCHERUS PROBUS, L. : Pr. A. N. S. viii. 164.
18. LEPTOCHERUS SPECTABILIS, L. : Ibid. 88.
19. RHINOCEROS OCCIDENTALIS, L. : Anc. F. Neb. 81. Syn. *Aceratherium*..
20. RHINOCEROS (HYRACODON) NEBRASCENSIS, L. : Pr. A. N. S. viii. 92. Syn. *Aceratherium nebrascense*.
21. MASTODON OHIOTICUM. *Small fragments of molar teeth.*

SOLIDUNGULA.

22. HIPPARION OCCIDENTALE, L. : Pr. A. N. S. vii. 59.
23. HIPPARION SPECIOSUM, L. : Ibid. viii. 311. Syn. ? *Hippodon speciosus*, Ibid. vi. 90.
24. ANCHITHERIUM BAIRDII, L. : Anc. F. Nebr. 67. Syn. *Palæotherium Bairdii*.
25. MERYCHIPPUS INSIGNIS, L. : Pr. A. N. S. viii. 311.

RODENTIA.

26. STENOPIPER NEBRASCENSIS, L. : Pr. A. N. S. viii. 89.
27. ISCHYROMYS TYPOS, L. : Ibid.
28. PALANOLAGUS HAYDENI, L. : Ibid.
29. EUMYS ELEGANS, L. : Ibid : 90.

PINNIPEDIA.

30. *ISCHYROTHERIUM ANTIQUM*, L.: Pr. A. N. S. viii. 89.

CARNIVORA.

31. *HYAENODON HORRIDUS*, L.: Pr. A. N. S. vi. 393.
 32. *HYAENODON CRUENTUS*, L.: Ibid.
 33. *HYAENODON CRUCIANS*, L.: Ibid.
 34. *AMPHICYON VETUS*, L.: Ibid. vii. 157. Syn. *Daphænus vetus*.
 35. *AMPHICYON GRACILIS*, L.: Ibid. viii. 90.
 36. *MACHAIRODUS PRIMAÆVUS*, L. and Owen: Anc. F. Neb. 95.
 37. *DEINICTIS FELINA*, L.: Pr. A. N. S. vii. 127; viii. 91.
 38. *LEPTARCTUS PRIMUS*, L.: Ibid. viii. 311.

II. REPTILIA.

CHELONIA.

39. *TESTUDO NEBRASCENSIS*, L.: Anc. F. Neb. 103. Syn. *Stylæmys nebrascensis*,
?Emys seu *Testudo hemispherica*, Oweni, Culbertsonii, et lata.
 40. *TRIONYX FOVEATUS*, L.: Pr. A. N. S. viii. 73, 312.
 41. *COMPSEMYS VICTUS*, L.: Ibid. 312.
 42. *EMYS OBSCURUS*, L.: Ibid.

SAURIA.

43. *MOSOSAURUS MISSOURIENSIS*, Leidy. Syn. *Ichthyosaurus missouriensis*, Harlan;
Mososaurus Maximiliani, Goldfuss; etc.
 44. *MEGALOSAURUS* ? (*DEINODON*) *HORRIDUS*, L.: Pr. A. N. S. viii. 72.
 45. *PALÆOSCINCUS COSTATUS*, L.: Ibid.
 46. *TRACHODON MIRABILIS*, L.: Ibid.
 47. *TROODON FORMOSUS*, L.: Ibid.
 48. *?CROCODILUS HUMILIS*, L.: Ibid. 73.
 49. *THESPESIUS OCCIDENTALIS*, L.: Ibid. 311.

III. PISCES.

50. *CLUPEA HUMILIS*, L.: Pr. A. N. S. viii. 256.
 51. *CLADOCYCLUS OCCIDENTALIS*, L.: Ibid.
 52. *ENCHODUS SHUMARDI*, L.: Ibid.
 53. *SAUROCEPHALUS LANCIFORMIS*, Harlan: Jour. Ac. Nat. Sc. iii. 337; Med. &
 Phys. Res. 362.
 54. *LEPIDOTUS OCCIDENTALIS*, L.: Pr. A. N. S. viii. 73.
 55. *LEPIDOTUS HAYDENI*, L.: Ibid.
 56. *MYLOGNATHUS PRISCUS*, L.: Ibid. 312.

Of the above list of vertebrate remains those of *Mososaurus*, *Cladocyclus*, *Enchodus*, and *Saurocephalus* were obtained from deposits of the cretaceous period.

The remains of *Deinodon*, *Palæoscincus*, *Trachodon*, *Troodon*, *?Crocodylus*, and *Lepidotus*, were discovered by Dr. F. V. Hayden, in a deposit, on the Judith River, which I have suspected to be of equivalent age with the Wealden formation of Europe.

The remains of *Compsemys*, *Emys*, and *Mylognathus*, were found at Long Lake, Neb. aska, together with those of *Trionyx*, the same species of which appears also to be common to the deposit just mentioned of the Judith River.

Oreodon, *Agriochærus*, *Pæbrotherium*, *Leptomeryx*, *Leptauchenia*, *Protomeryx*,
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Merycodus, *Titanotherium*, *Leptochaerus*, *Hyracodon*, *Merychippus*, *Ischyromys*, *Palæolagus*, *Eumys*, *Deinictis*, and *Leptarcus* are peculiar, extinct, mammalian genera, from the tertiary formations of Nebraska, which have heretofore been generally viewed as belonging to the eocene period, but which from their affinities, from the associated genera, and the absence of others so common in the eocene deposits of Europe, I suspect rather to belong to the miocene period. The first seven genera, above mentioned, are true ruminants, with the teeth constructed upon the same type as those of living ruminants;—a type which is not found in the tertiary deposits of Europe and Asia earlier than the miocene period.

Entelodon, *Palæochaerus*, *Rhinoceros*, *Hipparion*, *Steneofiber*, *Amphicyon*, and *Machairodus*, are common to the Nebraska tertiary deposits and to the miocene and later tertiary deposits of Europe; and they have not been found in the eocene formations of the latter continent.

Of the genera *Anchitherium*, *Hyopotamus*, and *Hyaenodon*, species are found common to the Nebraska tertiary deposits and the European eocene and miocene deposits.

Remains of *Palæotherium*, *Anoplotherium*, and *Lophiodon*, so common in the eocene formations of Europe, are entirely absent from the Nebraska tertiary formations.

Titanotherium of Nebraska most nearly approaches the miocene *Chalicotherium* of Europe and Asia.

The Nebraska rodents *Ischyromys*, *Palæolagus*, and *Eumys* most closely approach the *Arctomys*, *Lepus*, and *Mus* of European miocene and later deposits.

Very numerous remains of *Testudo* are found in association with the Nebraska tertiary mammals; and extinct species of the same genus belong generally to the miocene and later deposits of Europe.

The remains of *Mastodon* and *Camelops* mentioned in the list, I suspect to belong to the post pliocene age of the upper Missouri country.

Ischyrotherium appears to be an animal allied to the *Manatus*. Its remains are stated by Dr. Hayden to have been obtained from a lignite bed (miocene*) near Moreau and Grand rivers; but I must leave it to this indefatigable explorer to determine whether it belongs to the same age as the numerous extinct terrestrial mammals of Nebraska.

Thespesius I suspect to be a huge dinosaurian. Its remains are stated to belong to the lowest member of the lignite formations (miocene) of Grand River.

The species of *Clupea* was discovered by Dr. John Evans, in a tertiary deposit on Green River, Missouri; but the exact age of this formation I have no means of determining.

Investigation on the Rock Guano from the Islands of the Caribbean Sea.

BY WM. J. TAYLOR.

Though much has been written and published on the Columbian Guano of the Caribbean Sea, which is also termed Phosphatic Guano, native Super-Phosphate of Lime, &c., I have considered the subject not entirely exhausted, and have for some time past been paying especial attention to its composition, and have also endeavored to gather all possible information regarding its occurrence. To Dr. D. Luther, President of the Philadelphia Guano Company, I am particularly indebted, for his kindness in furnishing me with material for the investigation from the various groups of islands, and for information regarding

* Proc. Acad. Nat. Sci. viii. 268.

its occurrence. To Dr. F. A. Genth I am also indebted for allowing me to make the investigation in his laboratory. The Guano rock is found on islands N. E. and N. of the coast of Venezuela in the Caribbean Sea, and belonging to that Republic; the islands form groups or keys composed of one hundred or more small islands, inhabited principally and indeed almost solely, by water fowl, who resort there in immense numbers for laying their eggs. Mr. Cassin informs me that the birds are those commonly known as Gulls, Pelicans, and Cormorants; these have been the instruments by which the immense deposits of Guano have been formed. But what the process has been is a problem not yet fully solved.

The Columbian Guano is a hard rock, consisting of two distinct portions; the outer exterior crust, consisting of a white, frequently reniform coating, which in places where it is not decomposed has a polished surface not unlike enamel; it is composed of concentric layers, each of which is about two or more lines in thickness. The entire outer crust forms but a very small proportion of the whole rock; a carefully selected portion of this has been analyzed, which had not undergone any apparent decomposition, and upon which the enamelled surface was well preserved. In some portions the reniform surface is distinctly marked, and it resembles to a certain extent in its appearance the menilite from Menil Montant near Paris; the concentric layers composing it are well marked, and when they are fractured or cut across, an appearance is presented not unlike some varieties of agate.

The following is the result of analysis:—

(I).

2.0266 grammes	ignited lost	0.1640 grammes	gave	13.03 per cent.
"	"	Ag	0.0274	" Chlorine 0.44 " "
"	"	CaO, SO ₃	0.0419	" Sulphuric acid 1.93 " "
"	"	CaO, SO ₃	1.9965	" Lime 40.64 " "
"	"	2MgO, PO ₅	0.1654	" Magnesia 2.93 " "
"	"	2MgO, PO ₅	1.1753	" Phosphoric acid 37.15 " "
"	"	Residue	0.0111	" Residue 0.55 " "
"	"	Na Cl	0.1231	" Soda 3.23 " "

Loss by ignition,	13.03 per cent.	Oxygen ratio,	
Chlorine,	0.44 " "	" "	
Sulphuric Acid,	1.93 " "	" "	1.15
Phosphoric Acid,	37.15 " "	" "	20.82
Lime,	40.64 " "	" "	11.55
Magnesia,	2.93 " "	" "	1.17
Soda,	3.23 " "	" "	0.82

From the oxygen ratio of this it appears that the Phosphoric Acid and Lime exist in the proportion of 3CaOPO₅. The crucible after ignition showed indications that Chloride of Iron had been volatilized.

Below this exterior crust the rock has a varied appearance; it is of a dark brown color, in places quite black, varying in others to a lighter shade, in which portion are frequent cavities filled with minute crystals of gypsum, readily recognizable with a pocket lens. The darkest portion is the most solid, with a slightly vitreous lustre, and of a much greater tensibility and hardness than any other portion of the guano; it has a sub-concoidal fracture, sometimes splitting into thin fragments, which are translucent, through some portions of it I have observed frequently, thin irregular bands, 1-32d to 1-16th of an inch in width, which has the appearance of carbon.

This portion was selected for analysis with particular care, with the view to ascertain its exact composition; it was with difficulty reduced to the finest powder and treated with distilled water (in the cold) in a beaker glass, being fre-

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quently stirred for several days in order that the water should be in frequent contact with the particles; it was then collected on a weighed filter and washed with cold water until the filtrate showed no trace of Sulphuric Acid; the excess of filtrate was evaporated to dryness, and a thorough analysis made of it, the result of which is the following:—

(II.)

3.9922 grammes	0.3836 grams.	BaO, SO ₃	gave Sulphuric Acid	3.30
" "	0.1761 "	CaOCO ₂	" Lime	2.48
" "	0.0099 "	Ag	" Chlorine	0.08
" "	0.0531 "	2MgO, PO ₅	" Phosphoric Acid	0.85
" "	0.0089 "	Na Cl	" Soda	0.88
Per centage	Sulphuric Acid,	3.30	Oxygen ratio,	1.97
" "	Phosphoric Acid,	0.85	" "	0.54
" "	Lime,	2.48	" "	0.70
" "	Soda,	0.88	" "	0.22
" "	Chlorine,	0.08	" "	"

There was in this analysis a loss of Lime or Magnesia, also, of the insoluble residue.

Selections were made from other specimens which resembled very nearly that above described, it was treated in the same manner as (II.), but the results show a marked difference, there being a smaller percentage of Phosphate of Lime dissolved from (II.) than from (III.) and a proportional amount of Chloride of Sodium. To this fact I shall again refer.

The following is the result of analysis :

(III.)

The residue before weighing was carefully dried at 100° C.

2.7271 grammes left,	residue of 2.3177 gram.			84.98
" "	0.0095 grams.	Ag	gave Chlorine,	0.11
" "	0.3603 "	BaO, SO ₃	" Sulphuric Acid,	4.91
" "	0.2536 "	CaO, SO ₃	" Lime,	3.84
" "	0.0083 "	2MgO, PO ₅	" Magnesia,	0.11
" "	0.0600 "	2MgO, PO ₅	" Phosphoric Acid,	1.58
" "	0.0201 "	Na Cl	" Soda,	0.40
Chlorine,	0.11 per cent.	Oxygen ratio,		
Sulphuric Acid,	4.91 " "	" "		2.94
Phosphoric Acid,	1.58 " "	" "		0.88
Lime,	3.84 " "	" "		1.09
Magnesia,	0.11 " "	" "		0.04
Soda,	0.40 " "	" "		0.10

From another portion of the rock the black portion were selected for analysis, the quantity of sulphate of lime is very inconstant. The result of analyses were as follows :

(IV.)

0.9170 grammes,	.0536 gram.	BaO, SO ₃	gave Sulphuric Acid,	2.01 per ct.
" "	0.0510 "	CaO, CO ₂	" Lime,	3.13 "
" "	0.1532 "	Fe ₂ O ₃	" Sesquioxide of Iron,	16.71 "
" "	0.1123 "	Al ₂ O ₃	" Alumina,	12.25 "
2.0741 grams. lost by heating,	0.3254			15.69 "
" " insoluble residue,	0.1314			6.13 "

Owing to an accident to the platinum crucible just before weighing, the Phosphoric Acid, was not determined.

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Sulphuric Acid,	2.01 per cent.	Oxygen ratio,	1.20
Lime,	3.13 " "	" "	0.89
Sesquioxide of Iron,	16.71 " "	" "	5.00
Alumina,	12.25 " "	" "	5.70

The specimens from which the material for the above analyses were selected, I received from Messrs. Richards & Miller, agents for the Philadelphia Guano Company; there is doubt as to their exact locality; in appearance they correspond exactly with that from Monk's Island, but the results of the analyses are very different from those obtained from the specimens from this Island which I received from Dr. Luther.

That Alumina is present as a phosphate, in the Guano from Monk's Island, I have proved, by treating 3.4023 grammes of an average sample of the cargo of Schr. Trident from Monk's Island, with pure Caustic Potash in a silver dish, and was found to contain 1.32 per cent. of Alumina.

Specimens were given me from Monk's Island by Dr. Luther, the characteristic appearance of which has already been described.

1.5915 grammes were treated in a silver dish with Potash, but not a trace of Alumina could be detected; the residue dissolved in Hydrochloric Acid was found to contain Lime, 39.08 per cent.

The guano rock from Monk's Island when finely powdered and treated with distilled water, gave an acid reaction with litmus paper.

(V.)

1.7076 grammes (organic matter and water not determined.)

"	"	0.1993 gram.	BaO, SO ₃	gave Sulphuric Acid,	4.00 per cent.
"	"	0.0780 "	2MgO, PO ₅	" Magnesia,	1.64 " "
"	"	1.1999 "	CaO, CO ₂	" Lime,	39.34 " "
"	"	1.1461 "	2MgO, PO ₅	" Phosphoric Acid,	42.98 " "

Sulphuric Acid,	4.00 per cent.	Oxygen ratio,	2.39
Magnesia,	1.64 " "	" "	0.65
Lime,	39.34 " "	" "	11.10
Phosphoric Acid,	42.98 " "	" "	24.09

For the Oxygen of the Sulphuric Acid 2.39 there are required, 0.88 of the oxygen of the lime, and if to the remainder be added the Oxygen of the Magnesia we have 10.95, which is to the Oxygen of the Phosphoric Acid very nearly as 1 : 2

(VI.)

2.8678 grammes treated with distilled water gave :

"	"	2.7076	grams. residue,		94.41	per cent.
"	"	0.1287	" BaO, SO ₃	gave Sulphuric Acid,	1.49	" "
"	"	0.0655	" CaO, CO ₂	" Lime,	1.27	" "
"	"	0.0363	" 2MgO, PO ₅	" Phosphoric Acid,	0.81	" "

3.8426 grammes treated with distilled water gave :

"	"	0.0076 grams	Ag	gave Chlorine,	0.09 " "
"	"	0.0347 "	2MgO, PO ₅	" Phosphoric Acid,	0.78 " "
"	"	0.1099 "	BaO, SO ₃	" Sulphuric Acid,	1.33 " "

Lime,	1.27 per cent.	Oxygen ratio,	0.36
Phosphoric Acid,	0.81 " "	" "	0.45
Sulphuric Acid,	1.49 " "	" "	0.89

Guano Rock has been brought from another group of islands called Centinella, consisting of peaks, which sometimes attain a height of 800 ft. The rock is described as consisting of two layers, the upper of which is a dark-brown compact rock, varying slightly from the lower layer. This so called lower layer

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has certainly a surface exposed, as the specimen which I have examined, has been much weathered; the outer portion is partially reniform, which in places shows a slight enamel, though not near as distinct as on the specimens from Monk's and El Roque islands. It has evidently been formed in layers, which when broken across show a slightly banded appearance not unlike that already described as characteristic of portions of the rock from Monk's Island; the color varies from a buff to an ochreous brown; it is hard, brittle and much more readily pulverized than the Monk's Islands guano rock. An opinion may seem premature, but I am inclined to the belief that this has once been as the guano rock from Monk's Island, which has undergone changes from causes not yet fully studied, which seems more probable from the fact that small quantities of Phosphate of Alumina have been found in the Monk's Island rock.

The whitest portion of the rock was selected for analysis, which gave the following results:

(VII.)

1.5165 grams.	ignited gave .3469 grams.		22.87 per ct.
"	" 0.2000 grams.	insoluble matter, Silica,	13.18 "
"	" 0.0474 "	BaO, SO ₃ gave Sulphuric Acid,	1.07 "
"	" 0.6921 "	2MgO, PO ₅ " Phosphoric Acid,	29.23 "
"	" 0.0720 "	CaO, CO ₂ " Lime,	2.66 "
1.3048	" 0.2120 "	Al ₂ O ₃ " Alumina,	16.24 "
"	" 0.1628 "	Fe ₂ O ₃ " Sesquioxide of Iron,	12.41 "
"	" 0.6438 "	2MgO, PO ₅ " Phosphoric Acid,	31.60 "
"	" 0.0660 "	CaO, CO ₂ " Lime,	2.83 "
"	" 0.0057 "	2Al ₂ O ₃ , 3PO ₅ " Phosphate of Alumina,	0.43 "

Water?	22.87 per cent.	Oxygen ratio,	21.54
Silica,	13.18 " "	" "	6.84
Sulphuric Acid,	1.07 " "	" "	0.65
Phosphoric Acid,	31.60 " "	" "	20.24
Lime,	2.66 " "	" "	0.75
Alumina,	16.24 " "	" "	7.59
Sesquioxide of Iron,	12.41 " "	" "	3.61

The 0.65 of Oxygen of the Sulphuric Acid requires 0.22 of the Oxygen of the Lime, the remaining lime is most likely combined with Carbonic Acid, as nearly every specimen on treating with dilute acid gave a slight effervescence, (the guano rock from the vertical cliff contained nearly one per cent.), or possibly a remnant of the once phosphate of lime still exists. The alumina and phosphoric acid exist most likely in the form of Wavellite which has the formula $3\text{Al}_2\text{O}_3, 2\text{PO}_5 + 12\text{H}_2\text{O}$. It is difficult in a rock which is in progress of decomposition to obtain other than approximate formulæ.

This island of Centinella is now inhabited by immense numbers of waterfowl, many of which roost on the cliffs; some of these roosts have been long occupied, and judging from the signs on the rocks beneath, have been much resorted to. Mr. Richards of this city, who visited the islands a short time since broke off a portion of the concretion which cover the cliffs beneath a bird roost of this description; the organic properties had mostly been removed by causes which had converted the inorganic constituents into a guano rock, which in its composition, is not unlike that from Monk's Island and El Roque. Mr. Richards mentioned that when first obtained it had quite a strong odor, which has now almost disappeared; it is very hard and was difficult to powder.

The analysis of the concretion is as follows:

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(VIII.)

2.0904	grams. on ignition lost	0.2361	gram		11.29	per ct.
2.2904	" 0.0248	grams.	Al ₂ O ₃	gave Alumina,	1.08	"
.8470	" 0.066	"	BaO, SO ₃	" Sulphuric Acid,	2.67	"
"	" 0.4707	"	CaO, CO ₂	" Lime,	31.18	"
"	" 0.0406	"	2MgO, PO ₅	" Magnesia,	1.74	"
"	" 0.0143	"	Fe ₂ O ₃ & Al ₂ O ₃	" Iron and Alumina,	1.89	"
"	" 0.0506	"	insoluble,	" Silica,	5.97	"
1.8570	" 1.0153	"	CaO, CO ₂	" Lime,	30.68	"
"	" 0.0926	"	2MgO, PO ₅	" Magnesia,	1.79	"
"	" 0.0346	"	Fe ₂ O ₃ Al ₂ O ₃	" Alumina and Iron,	1.86	"
"	" 1.2520	"	2MgO, PO ₅	" Phosphoric Acid,	41.89	"
1.2142	" contained	0.0089	grams. CO ₂	" Carbonic Acid,	0.73	"

Alumina and Iron,	1.86	per cent.	Oxygen ratio,	0.86
Sulphuric Acid,	2.67	" "	" "	1.59
Carbonic Acid,	0.73	" "	" "	0.54
Lime,	31.18	" "	" "	8.86
Magnesia,	1.74	" "	" "	0.69
Phosphoric Acid,	41.89	" "	" "	23.25

1.59 Oxygen of Sulphuric Acid require 0.53 of Oxygen of the lime; 0.53 of Oxygen of the Carbonic Acid require 0.27 Oxygen of the lime, but if there is added to this remainder the Oxygen of the Magnesia there remains 8.75 Oxygen of lime, which is to the Oxygen of Phosphoric Acid 23.25, about in the ratio of 1:2, particularly as the Oxygen of the Alumina requires Oxygen of the Phosphoric Acid, to form a salt with a formula most probably corresponding to that of Wavellite as before mentioned.

Mr. Richards brought with him also a specimen of the recent alluvial guano, or bird excrement, as it may be justly termed; he obtained it from a little nook in the rocks, where it was protected from the intense dry heat of the sun and from the action of water. Mixed through it were several birds feathers. As may readily be imagined it had some odor, though not excessively strong.

7.4921 grams. were ignited in a platinum crucible, and gave a very strong and disagreeable odor like burning hair: it was moistened with carbonate of ammonia and again gently heated, and gave a loss of 4.0032 grams, = 53.83 per ct.

(IX.)

2.1975	grams. of the ash showed a trace of Alumina.			
"	" 0.2746	grams.	BaO, SO ₃	gave Sulphuric Acid 4.29
2.236	grams. 1.5150	"	CaO, CO ₂	" Lime 38.02
"	" 0.0913	"	Sand	" 4.83
4.0704	grams. ignited gave a loss	1.9171	gram.	47.10
1.9997	" Ash			
"	" 1.3858	grams.	CaO, CO ₂	gave Lime 38.89
"	" 0.2706	"	BaO, SO ₃	" Sulphuric Acid 3.79
"	" 0.2100	"	2MgO, PO ₅	" Magnesia 3.77
"	" 1.3173	"	2MgO, PO ₅	" Phosphoric Acid 42.21
"	" 0.0225	"	Sand	" 3.25
"	" 0.0164	"	Ag	" Chlorine 0.26
3.9652	grams. loss by ignition	1.9282	gram.	48.62
.8637	" 0.6892	grams.	CaO, CO ₂	gave Lime 39.12
.9794	" 0.0085	"	CO ₂	" Carbonic Acid 0.86
"	" 0.1250	"	BaO, SO ₃	" Sulphuric Acid 4.28

Lime	38.89	per cent.	Oxygen ratio,	11.05
Phosphoric Acid,	42.21	"	"	23.65
Sulphuric Acid,	4.79	"	"	2.57
Magnesia,	3.77	"	"	1.50

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2.57 Oxygen in Sulphuric Acid require 0.85 oxygen in Lime, there remains 10.19 oxygen of lime, which, if added to the oxygen of the magnesia makes 11.69, which stands with the oxygen of the phosphoric acid 23.65 near the ratio $2\text{CaO}, \text{PO}_5$.

A guano rock has recently been brought from a group of Islands called El Roque, in the Caribbean Sea. In composition it resembles very closely that brought from Monk's Island, the specimens that I have analysed, contain however, a much larger quantity of sulphuric acid than has been found in the latter rock. The appearance of the body of the two rocks is also much alike, but in the specimens which I have seen from El Roque the exterior crust is very different; it is rarely more than a slight coating; in some places it has a slight appearance of the enamel, when examined with a pocket lens; the surface is very irregular, often containing cavities which are lined with the same white coating. It was impossible to obtain sufficient of this for analysis: the analysis of the black portion of the rock was as follows:

(X.)

1.8636 grms. loss by ignition	0.1904 grms. water and organic matter	10.22 per cent.
1.4609 " " 1.0066 " " 0.3274 " "	grams. BaO, SO_3 gave	Sulphuric Acid, 7.70 "
" " " " 0.1118 " "	CaO, CO_2 " "	Lime, 38.67 "
" " " " 0.0116 " "	$2\text{MgO}, \text{PO}_5$ " "	Magnesia, 2.75 "
" " " " 0.0058 " "	Insoluble " "	0.78 "
" " " " 0.0058 " "	Fe_2O_3 & Al_2O_3 " "	Iron & Alumina 0.40 "
1.1680 grams	0.7936 gram. CaO, CO_2 gave	Lime, 38.12 "
" " " " 0.0879 " "	$2\text{MgO}, \text{PO}_5$ " "	Magnesia, 2.70 "
" " " " 0.7383 " "	$2\text{MgO}, \text{PO}_5$ " "	Phosphoric Acid, 40.49 "

Organic matter and water, 10.22 per cent.

Sulphuric Acid,	7.70	Oxygen Ratio,	4.61
Lime,	38.67	"	10.09
Magnesia,	2.75	"	1.09
Phosphoric Acid,	40.49	"	25.93
Alumina and sesquioxide of Iron,	0.40	"	
Insoluble,	0.78	"	

4.61 oxygen in Sulphuric Acid require 1.54 oxygen in lime; therefore remains 8.55 oxygen in lime which stands with the oxygen of Phosphoric Acid 25.93 in the ratio 1 : 3, showing that the phosphate in this specimen consists principally of $3\text{CaO} \text{ PO}_5$.

A specimen containing no organic matter was examined from Testigoe Island, but the rock was very much disintegrated; it was very porous, and evidently had been acted upon by some causes which were gradually removing all its components except the silica. In appearance it was largely a sandstone, as the analysis showed. The most compact portion of the specimen was selected, which was readily pulverized; the results of the analysis differ from all the other specimens. The following are the results:

(XI.)

1.2910 grams. insoluble silica	0.6722 grams.	52.07 per cent.
" " 0.0085 CaO, CO_2	gave	Lime, 0.37 "
" " 0.0206 2MgO	" "	Magnesia, 0.57 "
0.8806 grams.	0.1073 loss by ignition	Water, 12.17 "
0.8806 grams. insoluble	0.4600 grams.	Silica, 52.27 "
" " 0.1158 Al_2O_3	" gave	Sulphuric Acid trace,
" $2\text{Fe}_2\text{O}_3, 3\text{PO}_5$	0.0318 " "	Alumina, 13.03 "
" $2\text{MgO}, \text{PO}_5$	0.2394 " "	Phosp. of Iron 3.61 "
		Phosp. Acid, 17.41 "

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Silica,	52.07	per cent.		
Lime,	0.37	"		
Magnesia,	0.57	"		
Water,	12.17	"	oxygen ratio,	10.81
Sulphuric acid trace				
Alumina,	13.03	"		6.12
Phosphate of Iron,	3.61	"		
Phosphoric Acid,	17.41	"		9.81

The Alumina and Phosphoric Acid seem in this to be in the form of wavelite.

The guano rock from the various groups of islands has very varying composition, as has been seen from the foregoing investigations; it is found in layers, and the surface sometimes covered with an alluvial deposit; these layers are in places highly inclined, showing that since their deposition dynamic causes have altered their original position. This same phenomenon is described as occurring at the Chincha islands in the Peruvian guano, where it is found in layers two or three yards in thickness. Various theories have been formed and published as to the origin of the rock guano; these are doubtless premature, as the accounts as to its occurrence are founded on reports of those not accustomed to noting geological phenomenon.

Prof. C. U. Shepard has, with his characteristic energy, extended his mineralogical species to various portions of this rock, which he severally describes* and designates generally as Pyroguanite minerals, and entirely destitute of ammonia; but examinations made of an average sample of a cargo from Monk's Island showed one-half per cent. of nitrogen. Every specimen which I have examined, has on ignition given very marked evidence of burning organic matter. How this can be retained in a rock subjected to the agency of heated trap is as difficult to reconcile, as that the composition of minerals existing with and forming a part of its mass, as Prof. Shepard describes,* containing water in their composition. Moreover, how can a rock subjected to the agency of heated trap have as its principal basis a salt with the formula $2\text{CaO}, \text{H}_2\text{O}, \text{PO}_5$ which is the formula ascribed to it by Drs. Piggot and Beckell, of Baltimore, and which seems to be the proper composition of some portions, as shown by analysis of Monk's Island rock (V), though in the analysis of the specimen from El Roque (X) there is obtained the formula, 3CaO PO_5 .

As I have already mentioned, this Guano rock from *Los Monjes* has been called a native Super-Phosphate of Lime, but no satisfactory proofs are given as to its meriting such a name: phosphoric acid being found in solution after the guano is treated with water is no proof that it exists in a free state. Phosphate of Lime, when recently precipitated, is soluble to a slight extent in pure water (R. Phillips, Ann. Phil. 22, 188). Berzelius long since discovered Phosphates of Lime and Alumina in the water and deposits of hot springs at Carlsbad.† That Phosphates are insoluble and must be rendered free before becoming efficacious as fertilizers is an erroneous though a very prevalent opinion. According to Bischof‡ Phosphate of Lime must be regarded as present in all water running into the sea: it has already been detected in the waters of the Dee and and of the Don, and it will most likely be found in the waters of all rivers. Phosphate of Lime and Magnesia have also been found in the waters of an artesian well at Wildegg, in the Canton Argau (Switzerland). Phosphate of Lime has been shown to be present in sea water by Clemm§ and by Forchhammer.¶ According to Berzelius it is the *N*-phosphate which is found in the mineral waters.‡ which is readily soluble in water saturated with carbonic acid. The Basic-Phosphate of Lime is also readily soluble in water containing carbonic acid: Bischof gives

* Am. J. Sci. 12, xxii. 96.

† Gilbert's Annalen. lxxiv. 136.

‡ Chem. and Phys. Geology. vol. 2, p. 27 (Engl. edit.).

§ Joura. für prakt. Chemie xxxiv. 188.

¶ Berzelius, Jahresbericht xvi. 333.

‡ Gmelin. vol. iii. p. 183.

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a very interesting table of the degrees of solubility of the various basic-Phosphates of Lime in water saturated with carbonic acid gas.*

It is not only in carbonic acid waters that Phosphate of Lime is soluble; basic-Phosphate of Lime dissolves in 3.150 parts of water, containing one-twelfth by weight of Chloride of Sodium. The presence of Chloride of Ammonium increases the solubility still more.*

It is probable, therefore, that the solubility of the Phosphate of Lime Guano rock from Los Monges is owing to the presence of the Chloride of Sodium existing in it. By reference to the analyses (II and III), it will be seen that the Phosphate of Lime dissolved is in proportion to the Chloride of Sodium in the specimens. This will, however, require more detailed examination.

Though the rock from Centinella containing so large a percentage of Phosphoric Acid combined with Iron and Alumina may seem at first worthless as a fertilizer, no positive opinion should be formed or expressed without a very careful investigation of the subject, which I believe has never yet been made. It is true that Phosphate of Alumina is one of the most sparingly soluble substances known, though it is soluble in water saturated with Carbonic Acid, according to Bischof in about 6.828.000 parts, though in the water of the Carlsbad springs about double this quantity is held in solution, viz: $\frac{1}{3.125000}$.

Though the Phosphate of lime is applied to soils, and, as such, taken up by plants, there is no proof that it remains in that form until the plants have need of it; it enters into new combinations, some of which may be quite as insoluble as this Centinella rock. The Phosphate of Lime dissolved by the carbonated waters always found more or less in soils,† is decomposed by alkaline carbonates; the lime would therefore be converted into a carbonate, and a phosphate of the alkali will be formed.‡ Bousingault and Levy, Journ. des Debats, Dec. 5, 1852, found that the air in the interstices of arable soils contained as much as 22 to 23 times as much carbonic acid as the atmosphere, and when the soil has been recently moistened 245 times as much. Phosphate of lime lying in such a soil would be dissolved in a comparatively short space of time.

Carbonate of Iron is present more or less in every soil, and consequently if in a soil the carbonate of iron and phosphate of lime exist, both held in solution by a carbonate of the alkalies, a mutual decomposition may take place||, consequently we may have vivianite formed in the soil: instances are frequent of vivianite in fossils of the green sand of New Jersey,¶ but geological ages are not required to produce these changes. M. Jerome Nickles has recognised its presence in human bones, (Amer. Jour. of Sci. vol. xxi. p. 402.) he found in a cemetery at

* Chem. and Phys. Geology, vol. ii. p. 28.

† (Chem and Phys. Geol. vol. ii. p. 34.

‡ Researches that have been made by Lassaigne, Journ. Chim. Med. 3 ser. iv. 354; and Ann. de Chim. et. de Phys. 3 ser. xxv. 346, show that phosphate of lime is conveyed into the plants organism by water saturated with carbonic acid. Dumas (Comptes Rendus, xxiii. 1018,) holds the same opinion.

§ Bischof, Chem. and Phys. Geology, vol. i. p. 13. No. 19. Phosphate of lime dissolved in carbonated water forms Carbonate of Lime, which is precipitated, and alkaline phosphate which remain in solution.

|| Phosphate of lime dissolved in carbonated waters and proto-carbonate of iron form a proto-phosphate of iron, which is precipitated, and bi-carbonate of lime which remains in solution. (Bischof vol. i. p. 13, no. 20.

¶ In the green sand of New Jersey, the decomposition is not owing probably to the carbonate of iron, but to the sulphate resulting from oxydation of the iron pyrites. (Bischof, vol. i. p. 14, no. 21.) Phosphate of iron and proto-sulphate of iron form sulphate of lime and proto-phosphate of iron, Similar changes probably result in this guano rock, as in many specimens we find crystals of gypsum recognizable with a pocket-lense.
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U O P N

Kumont a village in the department of La Meurthe, the earth of which was very ferruginous, two arm bones of a female, a cubitus and a radius, having a deep bluish green color. On breaking, the alteration was found to be complete, and a qualitative chemical examination proved it to be phosphate of iron. It is to be regretted that a quantitative analysis was not made, to have determined whether all the bone phosphate had been decomposed and the transformation into phosphate of iron complete. M. Nickles, on examining the medullary cavity with a lens, found among the sinuosities left by the hardened marrow brilliant points which were distinctly crystals of vivianite. The bones were in a perfect state of preservation, and afforded, when treated with hydrochloric acid, a skeleton of gelatine, proving that gelatine does not resist the absorption of the ferruginous compound.

Various theories have been formed and published as to the origin of the rock guano; these are most likely premature, as the accounts as to its occurrence are founded on reports of those not accustomed to noting geological phenomena. The continued and gradual upheaval of islands in the ocean and their depression is a well established geological fact.

The islands of the Caribbean sea are very varied, some are quite low and covered with sand composed of fragments of shells, madrepore and corals, which can readily be distinguished with a pocket lens. These sands are resorted to by myriads of waterfowls for laying their eggs. One of the captains who visited there mentions, that it is necessary to make one's way through them with a stick. Other islands attain heights of 800 feet; it seems improbable that such heights could be created by accretions of guano and sand, when the islands were subject to a continued action of the waves of the ocean. The inclination and irregularity of the guano layers renders it not improbable that the dynamic causes which produced this distortion, elevated at the same time the islands.

It is most probable that the guano rock from some of the islands has been changed in its composition by reactions of the salts contained in sea water, but before such reactions can be fully explained, accurate analyses must be made of this sea water.

It is a remarkable fact, that the composition of the ash from the recent guano from the heights of the Centinella rock composed of phosphates of alumina and iron, should have a composition so very near to that of the guano rock from the Los Monges and El Roque islands.

The frequent occurrence of alumina and iron is to be remarked in the guano rocks.

The upheaval and subsidence of land is caused not only by earthquakes, (Lyell's Principles of Geology, 8th edit. chap. xxxi.,) but by other changes such as are in progress in Sweden and Norway, and in Greenland. The upheaval of islands in the Caribbean Sea may most likely be ascribed to volcanic action, some of these are within 150 miles from Gaudaloupe. (Lyell's Principles, 336,) von Buch inclined to the belief, that the volcanic chain of the Andes was connected with that of the West India or Caribbean Islands. The truth of this conjecture has been almost set at rest by the eruption of the volcano at Zamba, in New Grenada, at the mouth of the river Madalena.*

The vicinity of the volcanoes may give additional salts to the sea water.

NOTE.—I have just been informed by Dr. Luther, that from analyses lately made in Baltimore of a cargo of rock guano, that has lately arrived from the island of Testigoes, there has been found from forty to forty-five per cent. of phosphoric acid.

* Comptes Rendus, 1849, vol. xxix. p. 531.

April 7th.

Vice President BRIDGES in the Chair.

A communication was presented for publication in the Proceedings, entitled :

Description of six new species of fresh water and land shells, by Isaac Lea. Referred to a Committee.

On leave granted, Dr. LeConte moved that a special vote of thanks be tendered to Dr. Benjamin Vreeland, U. S. N., for his valuable donation of Esquimaux Skulls received this evening. Which motion was unanimously adopted.

April 14th.

Vice President BRIDGES in the Chair.

Mr. Lea called the attention of the Academy to the specimen of *Unio Spinosus* presented by him this evening. The inner face of the valve has an arch leading toward the spine, which is probably hollow ; thus confirming the view of the mode of formation of the spine previously stated by him.

April 21st.

Vice President BRIDGES in the Chair.

A Communication was received from W. J. Taylor, entitled " Examination of a Nickel Meteorite from Oktibbeha county, Miss.," which was referred to a Committee.

April 28th.

Vice President BRIDGES in the Chair.

The Committees on Mr. Lea's paper, entitled " Description of six new species of fresh water and land Shells," and on Mr. Taylor's " Examination of a Nickel Meteorite, &c.," reported in favor of publication.

Description of Six new species of Fresh Water and Land Shells of Texas and Tamaulipas, from the Collection of the Smithsonian Institution.

BY ISAAC LEA.

UNIO BERLANDIERII. Testâ lævi, subellipticâ, inflatâ, posticè subrotundatâ inæquilaterali ; valvulis crassis, anticè crassioribus ; natibus grandibus, elevatis, tumidis, ad apices minutè undulatâ ; epidermide micans, tenebroso-fuscâ, obsoletè radiatâ ; dentibus cardinalibus magnis, erectis, subcompressis, valdè crenulatis et in utroque valvulo duplicibus ; lateralibus longis, crassis, subcurvis lamellatisque ; margaritâ vel purpurascente vel salmonis colore tinctâ et iridescente.

Hab. Matamoras, Tamaulipas, Mexico. Luis Berlandier, M. D.*

* The collection made by Dr. Berlandier was purchased by Lieut. D. N. Couch, U. S. A., and liberally presented to the Smithsonian Institution.

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• *UNIO POPEII*. Testâ lævi, transversâ, compresso-cylindraceâ, ad basim subemarginatâ, valdè inæquilaterali, ad latere planulatâ, posticè truncatâ; valvulis subtenuibus, anticè crassioribus; natibus parvis, prominulis, ad apices granulatis; epidermide vel tenebroso-olivâ vel fuscâ, obsoletè radiatâ; dentibus cardinalibus compressis, erectis, acuminatis crenulatisque; lateralibus prælongis, lamellatis subrectisque; margaritâ vel albâ vel salmonis tinctâ et iridescente.

Hab. Devil's River and Rio Salado, Texas. Capt. Pope, U. S. A.

UNIO BAIRDIANUS. Testâ lævi, ellipticâ, paulisper inflatâ, postice compressâ, valdè inæquilaterali; valvulis subtenuibus, posticè crassioribus; natibus prominulis, ad apices concentricè undulatis; epidermide tenebroso-fuscâ, obsoletè radiatâ; dentibus cardinalibus parvis, erectis, acuminatis crenulatisque; lateralibus longis, lamellatis subcurvisque; margaritâ albâ et valdè iridescente.

Hab. Devil's River, Texas. Capt. Pope, U. S. A.

ANODONTA HENRYIANA. Testâ lævi, oblongâ, inflatâ, ad basim et anticè compressâ, subæquilaterali, posticè truncatâ; valvulis pertenuibus; natibus depressis, planulatis, ad apices minutè et irregulariter undulatâ; epidermide nitidâ, vel luteâ vel luteo-viridi, obsoletè radiatâ, et vittatâ; margaritâ cœruleo-albâ et valdè iridescente.

Hab. Matamoras, Tamaulipas, Mexico. L. Berlandier, M. D.

HELIX (POLYGYRA) COUCHIANA. Testâ supernè paulisper elevatâ, subplanulatâ, infernè subinflatâ; nitidâ, albidâ, longitudinaliter et subtiliter striatâ, minutè perforatâ; anfractibus quinis; aperturâ rotundatâ, quinquedentatâ; labro subacuto.

Hab. Texas. L. Berlandier, M. D.

HELIX (POLYGYRA) TAMAULIPASSENSIS. Testâ supernè paulisper elevatâ, subplanulatâ, infernè subinflatâ, nitidâ, albidâ, longitudinaliter et subtiliter striatâ, minutè perforatâ; anfractibus quinis; aperturâ lunatâ, tridentatâ; labro spissato, reflexo.

Hab. Texas. L. Berlandier, M. D.

Examination of a Nickel Meteorite, from Oktibbeha County, Mississippi.

BY WM. J. TAYLOR.

This highly interesting and unique meteorite was found in an Indian mound in which excavations were being made in a search for Indian antiquities, in Oktibbeha County, Mississippi. It then weighed five and a quarter ounces; in shape it resembled a hen's egg. When found, there was a fissure which divided it almost equally into two parts. The person who discovered it seeing this, placed it upon an anvil, and with one blow of a sledge-hammer, divided the meteorite. One half was forged, with the intention of manufacturing it into a cutting instrument of some description; the other remained in its original state; excepting that its exterior was filed smooth and bright.

To Dr. William Spillman, of Columbus, Mississippi, I am indebted for the material for this investigation; he obtained the meteorite from the man who first found it. The unforged half he brought with him on a recent visit to this city, and a portion of which he has presented to the Academy, on the condition that it should be carefully cut, so that the surface which formed one side of the existing fissure above mentioned should be preserved and sent to him. It was proposed to have it cut by a lapidary, but he attempted it without success, using diamond dust on the wheel. On making the first incision, about one-eighth to one-sixteenth of an inch in depth, he found it impossible to proceed, and refused to make farther attempts to cut the meteorite. Mr. John Phillips, a fellow member of the Academy, and an amateur machinist, on hearing of our difficulties, kindly offered to saw the specimen, and succeeded admirably, though it was with very great difficulty. He spoke of its peculiar toughness, (the hard-

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ness not being excessive;) it resisted the saw very much, which rendered the cutting exceedingly tedious, heating the saw to such a degree as to oblige a discontinuance of the operation every four or five minutes, but it was remarkable that it did not dull the blade in the least.

The toughness of the iron was clearly shown when, for the purpose of analysis, it was attempted to cut off portions of it with a chisel; the excessive toughness of the iron rendered this very difficult, without the aid of the saw. The resistance of this meteorite to the action of acids was most remarkable. Strong nitric acid did not act upon it in the cold. Moderately dilute sulphuric acid did not act upon it. Strong and boiling hydrochloric acid acted upon it very gradually.

The above named acids failing to show the slightest trace of the Widmannstättian figures, a mixture of nitric acid and hydrochloric was used, boiling; but even after this operation no trace of them could be distinguished. The action of the aqua regia was gradual and peculiar, producing on the polished surface of the meteorite very small holes, varying in size from a pin's point to those as large as a pin's head. From the appearance of the surface of the meteorite, which formed a side of the fissure before described, I had hoped to obtain by etching beautiful Widmannstättian figures, as there is on this portion indistinct traces of that which would at first glance be called a crystalline structure.

The color of the metal is a silvery grey with a pinkish tinge. Its hardness is not excessive, yielding readily to the file. The tensibility, as before mentioned, was very great. The passivity was proved by testing it with a neutral solution of the sulphate of copper.

The specific gravity at 25° Cels., was found by Dr. F. A. Genth to be 6.854, which is too low, but owing to the numerous fissures through the meteorite filled with limonite, it was impossible to obtain the exact specific gravity of the metal. I used particular care to obtain a portion free from the flaws, but without effect. I take this opportunity to express my thanks to Dr. Genth for allowing me the use of his laboratory in making the examination. The following is the result of my analysis:

1.9421 grammes were dissolved in aqua regia.

1.4731 grams.	NiO	gave of Nickel	59.69 per cent.
1.0452 "	Fe ₂ O ₃	" Iron	37.69 "
0.0221 "	CuO	" Copper	0.90 "
0.0072 "	Al ₂ O ₃	" Aluminium	0.20 "
0.0105 "	Co ₂ O ₃	" Cobalt	0.40 "
0.0048 "	SiO ₂	" Silicium	0.12 "
0.0069 "	2MgO, PO ₅	" Phosphorus	0.10 "
0.0059 "	CaO, CO ₂	" Calcium	0.09 "

99.19

The slight loss of eight-tenths of one per cent. I think is owing to some small portions of limonite existing in the minute fissures already mentioned.

The 0.10 per cent. of phosphorus correspond to 0.64 per cent. of schreibersite, (P. Ni₂ Fe₄.)

It was first attempted to dissolve in hydrochloric acid, but the action of the acid, even when boiling, was so very gradual that nitric acid was added.

I endeavored to separate the nickel and cobalt by Liebig's new method, viz., by precipitating the nickel as a sesqui-oxide, by passing chlorine through an alkaline solution of the two metals in hydrocyanic acid and potash, but it was found not to answer; the separation was made by his former method by oxide of mercury.

The composition of this remarkable meteorite is in itself sufficiently interesting for mineralogists, without any attempts to account for its origin, either terrestrial or celestial. We must remain in doubt as to the exact locality where it was originally found, as it may have been carried by the Indians from a distance to be entombed in this mound, and it may have been considered by them.

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to have a special value, and possibly to possess peculiar virtues, from its being discovered in such a place.

May 5th.

Vice President BRIDGES in the Chair.

Communications were received from Col. J. J. Abert, dated Washington, April 28, 1857, referring to a species of mocking-bird, supposed by him to be new; and from F. B. Meek and F. V. Hayden, M. D., entitled "Explorations under the War Department: Descriptions of new Cretaceous and Tertiary Fossils, collected by Dr. F. V. Hayden in Nebraska, under the direction of Lieut. G. K. Warren, U. S. Top. Engineers, with some remarks on the geology of the Upper Missouri country;" which were referred to Committees, as usual.

Mr. Lea stated that he proposed to change the name of *Unio umbrus* and *Unio Wheatleyi*, to *U. umbrans* and *U. Catawbensis*, having inadvertently repeated these names in his papers of Feb. 17th and March 10th, 1857.

Mr. W. Parker Foulke requested permission to submit to the attention of the Academy some observations of the late Mr. Hugh Miller, printed in his recently published work, entitled "The Testimony of the Rocks."

It may be remembered, said Mr. F., that about three years ago I noticed at one of the stated meetings of the Academy, what appeared to me an interesting example of the fallacious use of a generalization—the inference from a term used in one sense, of what could follow from it only when used in another sense. From the fact that the carboniferous rocks lie within the series which geologists, for special reasons, group into one system which they call the "palæozoic," Mr. Miller had thought himself authorized so far to treat this system as a unity, as to consider it properly characterized as a whole, for the object of his argument, by the carboniferous member; and thence to infer that the palæozoic periods together constituted the Mosaic day during which the creation of vegetables took place. No influence had been allowed to the fact that distinctive types of animal organization had been the chief motives for the discrimination between the "palæozoic" and "secondary" rocks as two systems; but the distinction being thus adopted by others, the author had assigned one of the systems entire to the vegetable creation, and the other to that of reptiles.

You will remember, Mr. President that, before the time to which I refer, it was a subject of private remark amongst the members of the Academy, that a large portion of the zeal and talent employed in drawing conclusions from the generalizations of discoveries in natural science, was applied to premature inferences, or in disproportionate subordination to incomplete metaphysical inquiries. This evil was not confined to men of one pursuit, or of one school: but it affected every department of "natural science," and of the abstract sciences most nearly connected with it. In geology, as well as in ethnology, philology, and general natural history, we had frequent occasion to notice the conflict of unnecessary speculations, and of irrelevant or unseasonable inferences; and the temporary withdrawal of much mental activity from the legitimate paths of scientific inquiry. The interval is short since the investigations of our day were fairly opened; and already the necessary subdivisions of labor are so numerous as to demand the most sedulous devotion to each. Yet we saw laborer after laborer diverging from his road to engage upon one or another side of metaphysical controversies, which could not be finally determined except by methods

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proper to the natural sciences; nor even by these, unless after greater accumulation and more accurate generalization of facts than had been accomplished. In the eagerness excited by these controversies, we also noticed, especially in respect to such as were of a kind to attract popular attention, that there was caused a bias unfavorable to the ascertainment of fact; and that the legitimate uses of actual discovery were thwarted by irregular processes, which for the most part were unconsciously adopted, but which were not for this reason the less pernicious to the progress of natural knowledge. In these circumstances, the rationale of the methods employed by writers upon natural history or the physical sciences in general, became a peculiarly important subject for the scrutiny of the Academy; and in formally presenting that subject, I felt assured that my propositions would serve only as the means of concentrating thoughts already entertained by the members. To give a suitable illustration of the irregularity in question, there were several reasons for selecting the discourse of Mr. Miller, entitled "The Two Records, the Mosaic and the Geological." It had just been republished in this country; its author was widely known in both hemispheres by his interesting discoveries in the old red sandstone; and, because of his having written so as to be easily understood by persons not previously skilled in geology, his publications had been read by probably a larger number of persons than had before undertaken the perusal of treatises on the same subject. Moreover, he had written with special reference to several leading controversies which engaged the popular attention; and his works were frequently appealed to with more or less pertinency in relation to the Noachic deluge, the origin of the varieties in the animal and vegetable kingdoms, and the geographical distribution of species. He thus served as a medium of communication between the studies of scientific men, and the speculations of the general reader. Lastly, his character and motives were unimpeached; and thus the force of personal considerations was added to those of learning and judgment. I was careful, Mr. President, to announce at the outset, that what was intended in my criticism had reference to the "logic of the natural sciences;" but under the comity proper between this Academy and the cultivators of those sciences throughout the world, it certainly did not appear to me necessary to disclaim all design to charge upon any person a wilful misuse of reasoning. Nevertheless, as a manifestation of the feeling with which the essay of Mr. Miller was reviewed, I used these words, which were printed in our Proceedings: "The high esteem in which the character of Mr. Miller is deservedly held by readers in the United States, where his writings are widely circulated, and the respectful manner in which his interesting researches have occasioned his name to be mentioned by authors eminent in the department of geology, give to such of his writings as bear upon the biblical question, peculiar importance with reference to the community at large." There was, therefore, no question proposed upon matter of fact, nor any imputation upon the motives of Mr. Miller. My remarks obtained the general concurrence of the members who heard them; at whose instance, and not at my own, the minute of them made by the Secretary was published with the other proceedings of the evening.

Sharing with you, Mr. President, and our fellow members, the profound sentiment produced in this country by the melancholy scenes which closed the useful life of Mr. Miller, I am sure of your participation with me in the surprise and regret with which I have read the following paragraphs, at pages 171, 172 and 173* of "The Testimony of the Rocks." (Mr. Foulke here read the passages referred to.)

That a member of this Academy could be permitted to make, against such a man as the lamented deceased, a gratuitous charge of *intentional misrepresentation*; and that the charge could be deliberately sanctioned, and printed under your authority and that of the other distinguished gentlemen who were present at the meeting of May 9, 1854—some of whom are now here—seems so far beyond any license known to a respectable association, that I confess myself at a loss

* Boston Edition, 1857.

to find an acceptable explanation of the credence which has been given to the supposition. I need not say, in this Hall, that the thing is impossible. Mr. Miller is no longer among the living; the hand of death has removed restraints which might have prevented the voluntary proffer of any denial of such an imputation as is implied upon me, upon you, and upon our associates, by the paragraphs which I have read to you. I shall have your and their approval, when I give to the memory of the deceased, as a tribute of respect, the most emphatic disclaimer of any thought which could impeach the integrity of his motives in the construction of his argument; or which could attribute to him conscious neglect of the rights of others, in that most unfortunate interpretation which he has put upon the Proceedings of this body.

Having said thus much towards the dead, let me add a few words in the way of caution to ourselves. Each of us is engaged in some pursuit which touches adversely the opinions, the prejudices, the self-love, perhaps the religious sentiment of a portion of mankind. Even in what might appear to an unimpassioned observer the most tranquil of occupations, there arise competitions; and the very love of truth often makes us impatient disputants. We have seen that under a sudden sensibility to a logical criticism, not so phrased as expressly to forbid the meaning erroneously attributed to it, a stranger, with no cause of quarrel, has been supposed by an author of respectable fame to make an accusation of mendacity against him; and a learned body of established reputation has been believed to have promoted the publication of the charge. To a judgment thus unconsciously clouded, see how naturally all that followed became distorted. I had said that the proceeding of the author was "a fallacious use of a generalization made for a purpose, and upon a principle not properly available for the writer's argument;" and the author forgetting the distinction between a *fallacy* and a *falsehood*, and overlooking too the grammatical relation of the parts of the sentence, italicized the words "*made for a purpose*," so that his readers could not avoid the suggestion that it was the "*fallacious use*," and not the "generalization," which had been *made for a purpose*, inapplicable to his object. Nay more; such was the effect upon the author's mind, that he closed his quotation with an "&c." at the very point at which began the sentence which I have read to you, referring to the "esteem in which he was *deservedly* held in the United States"—took no notice whatever of the tenor of that sentence, but said, "so far the Proceedings of the Academy," &c. It need not surprise you, sir, after such examples, to find that I am said to treat the carboniferous period as the latest of the palæozoic series. A glance at my phraseology will be sufficient to show you that the "series" referred to was one reckoned "from the carboniferous rocks downwards, (backward in order of time,)" and that the rocks in this series were selected by me to show the inconsistency of the argument with the facts; and that my choice had no connection with the limitation of the palæozoic *system*. That my use of the word *series* was not a novelty, may be easily shewn by reference to British as well as American authors.* I have no wish to multiply these observations; my peculiar personal interest in the misapprehensions of the author, ends with the explanation which has been made in relation to that which wounded his feelings; yet, in illustration of the reflection to which my last remarks have been directed, it may not be improper to mention two or three additional examples. Thus, although a member of this body, surrounded by the choice geological library through the use of which so many Americans have become known abroad for learning in natural science, it is assumed that I am ignorant of the relation of the "Permian" rocks to the Palæozoic system—a relation

* "The use of the word *series* in describing the subdivisions of the palæozoic system, is by no means an innovation, but is, on the contrary, a return to the language formerly in very common use among the members of the Geological Society, as any one may see on turning over the pages of the early volumes." *Synopsis of the Classification of the British Palæozoic Rocks. By the Rev. Adam Sedgwick, M. A., F. R. S., Woodwardian Professor and Fellow of Trinity College, Cambridge. London, 1855.*

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indicated during at least twenty years in elementary treatises. Again, although a citizen of Pennsylvania—a State one of whose most remarkable evidences of wealth is the fact that she is the holder of the great anthracite basin and of a portion of the chief bituminous measures—although a resident of Philadelphia, whose principal domestic export is coal, it is assumed that I could overlook the fact that there are vast deposits of coal in North America. It ought, perhaps, to be said in this connection, that the author has wholly misunderstood my observations with respect to the comparative quantities of vegetable product in the carboniferous period and that in which we live. Considering that we do not know the extent of the area of growth in the carboniferous period, nor the length of time consumed in forming the deposits of vegetable matter which make the coal beds; and taking into view solidity as well as size, and the multiplication of individual growths, it is certainly not going very far to say that it is not “patent to all” that the total quantity of vegetable growth upon the earth during a given space of time was greater in the carboniferous than in the present period. I made no affirmative assertion; and in the absence of conclusive proof, I have none to make now. It is enough to indicate the irrelevance of the reasoning employed by the author upon pages 174 and 175.

With respect to the scientific criticism which has occasioned these remarks, it gives me no concern. It, or its equivalent, will be judged by proper persons. It has been in the hands of many whose minds have been disciplined in the best methods of inquiry; and from no quarter had I reason to suspect the existence of dissent until the appearance of the book before us. It is to be hoped that on both sides of the Atlantic there will be cultivated a mutual confidence, which shall prevent misconception of motives; and that hereafter the vigilance which is indispensable to preserve the pursuits of philosophy from unconscious bias, shall not be misconstrued as the intrusion of an unfriendly spirit. *Felix quem faciunt aliena pericula cautum.* In conclusion, I beg to renew the expression of my regret, that any accident should have made me the occasion of pain to a gentleman so deserving of our consideration and friendly esteem as was the author of “The Testimony of the Rocks.” It cannot but enhance the appropriateness of such an expression at this meeting, that beside yourself and your colleague, the other Vice President, who usually preside over the deliberations of the Academy, I see here to night its venerable President, and several other learned members, whose names are familiar to cultivators of the natural sciences in Great Britain.

May 12th.

Vice President BRIDGES in the Chair.

Communications were received, for publication in the Proceedings, entitled, as follows:

Notes Explanatory of a Map and Section illustrating the Geological structure of the country bordering on the Missouri River, from the mouth of Platte River to Fort Benton, in lat. $47^{\circ} 30'$ N. long., $110^{\circ} 30'$ W., by F. V. Hayden, M. D.

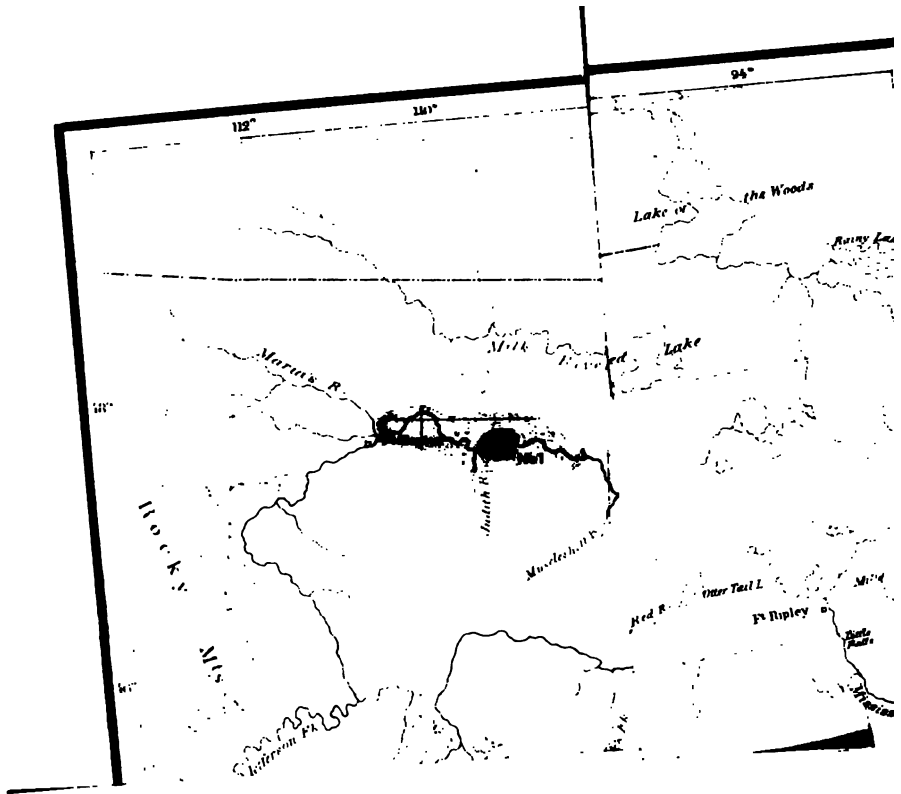
On the Larva of *Thyreus Abbottii*, by J. P. Kirtland, M. D.

Which as usual were referred to Committees.

Mr. Harris observed, in relation to the specimens of cotton-wood and chips cut by beavers, presented this evening, that they had been obtained by him from the Missouri River, between Fort Union, at the mouth of the Yellowstone, and Fort Clark, at the Mandan Village. He added, that in returning from a trip up the Missouri to the mouth of the Yellowstone, in company with the late J. J. Audubon and party, in the month of September, 1843, our Mackinaw boat was moored for the night on the right bank of the river, under shelter of timber on the bank, which was here about twenty feet above the water at its then 1857.]

rather low stage. Our guide and pilot in descending the river, Prevost, who was an old trapper, hired by Mr. A. at St. Louis for the trip, soon discovered signs of the beaver, and presently a newly constructed beaver-house about one hundred yards above the boat. It was too late to examine the premises, and after cutting wood, building a fire, and cooking our supper, we turned in for the night. Very early in the morning, before breakfasting, we hastened to examine what had been the object of more than one expedition on the Yellowstone, and which had, heretofore, baffled our search. Prevost assured us that the noise and smell of smoke, and cooking from our camp, must have driven the beaver to a place of safety soon after our landing the night before, and that we could only gratify our curiosity by the inspection of the building; whereas, had daylight permitted, we might, at first landing, have proceeded quietly and stopped the covered outlet from the house to the water, and thus secured the inmates, and this only by using the utmost caution in approaching without giving them the wind of us, or making the slightest noise, even the crackling of a dry twig under our feet; so religiously did he believe in their superhuman sagacity in discovering and avoiding danger. Thus assured, I took my gun, more from the influence of the habit of some months of seldom stirring from camp without it, than from any expectation of seeing a beaver. I followed the water to the outlet, while others took the bank; here I stood watching the operations of those above, who had commenced removing the branches of cotton-wood which formed the covering of the domicile. I was startled suddenly by the splashing of the water at my feet, and, looking down, I saw the dusky back of a beaver a few inches under the surface, gliding out into the deep water of the river, and before I could prepare and bring my gun into position, he was out of sight. Nothing could have been easier, had I been prepared, than to have shot him as he thus passed within three feet of the spot on which I stood. Thus, from too much reliance on popular tradition of the unerring instinct of this animal, was I prevented from adding the skin, and description, and measurements of a fresh specimen of the beaver to the trophies of our expedition. As the beaver passed down the stream he was seen to rise for air, abreast of our boat, by some of the men on board. We then proceeded to unroof the house by removing the cotton-wood branches, which covered it for several feet in thickness; they extended for a considerable width on each side, and covered the passage from the house to the water; this passage was about fourteen inches square, as neatly excavated as a ditcher could have made it with a spade; it was from twenty-five to thirty feet long, following the slope of the bank, and ending some two or three feet under the water. The branches were laid with their butts upmost, and formed a complete thatching to the house, nearly weather-proof. The house itself was a vertical excavation into the bank, cylindrical in form and about three and a half feet in diameter; the slope of the bank, where it was cut, gave it the figure of a section of a cylinder of about four feet high on the side of the bank, and the height of the passage to the river, on the other, about fourteen inches. The bottom and walls of this room were smooth and hard as though they had been pressed or beaten, but not plastered. The circle was apparently perfect in form. I should have said, it was rather more than half-way up the bank. Prevost said that the house was unfinished, and that, before winter, the whole interior earth and brush of the sides and roof would have been neatly plastered with clay so as to render it entirely weather-proof. The quantity of cotton-wood branches and saplings used in this structure was enormous; I suspect the measurement would have been about three cords, or as many wagon loads, and so closely impacted that it was only after considerable labor that a breach was made. On the bank above was the area of *stump-land* where they had felled their timber, taking what was suitable from the most convenient distance. The large block presented this evening was cut from the largest log felled; the branches only were taken, leaving the trunk where it fell. Small saplings were taken entire. The smaller piece, which is cut at both ends, was the butt of a bough or sapling, which, in their attempt to drag to the bank, had become wedged among a clump of bushes in such a manner that they could not

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back it out again, owing to the resistance of the branches on the ground and of other bushes, so, like the sailor who throws overboard a portion of his cargo to enable him to save the rest, they cut off this piece that they might steer clear of the difficulty with the remnant of their treasure. The chips are from the larger specimen; in cutting them out they must work horizontally around the trunk, and when they have cut two grooves at the proper distance apart, they take hold of the isolated portion with their teeth, and split off portions *vertically*, and so in succession split off chips until they have girdled the tree; a second course is then removed from the bottom of this, and so on diminishing the size of the chips until the tree is only supported by a portion of its heart connecting the apices of two cones—one on the stump upright, the other on the butt of the log inverted. In this manner, also, the Indians cut down trees with their hatchets, leaving the same form of a cone on the butt of the log and on the stump, as their beaver neighbors have done before them.

May 26th.

MR. S. ASHMEAD in the Chair.

The Committees to whom were referred the following papers, reported in favor of their publication :

“Notes Explanatory of a Map and Section illustrating the geological structure of the country bordering on the Missouri River, from the mouth of Platte River to Fort Benton, in lat. $47^{\circ} 30' N.$, long. $110^{\circ} 30' W.$, by F. V. Hayden, M. D.”

“Explorations under the War Department: Description of new Cretaceous and Tertiary Fossils collected by Dr. F. V. Hayden in Nebraska, under the direction of Lieut. G. K. Warren, U. S. Top. Engineer, with some remarks on the geology of the Upper Missouri country; by F. B. Meek and Dr. F. V. Hayden.”

“On the Larva of *Thyreus Abbotii*, by J. P. Kirtland, M. D.”

EXPLORATIONS UNDER THE WAR DEPARTMENT.

Notes Explanatory of a Map and Section Illustrating the Geological structure of the country bordering on the Missouri River, from the mouth of the Platte River to Fort Benton, in lat. $47^{\circ} 30' N.$, long. $110^{\circ} 30' W.$

BY F. V. HAYDEN, M. D.

(*Communicated by permission of the Secretary of War.*)

The facts from which the accompanying map and section have been constructed, are mainly the results of three years' explorations by me in the north west;* and although some of them have heretofore been given to the public in brief written accounts of the geology of that country,† this is the first time they have been presented in this form.

In regard to the Map, I would simply state that it is based on the most recent topographical explorations. The geology, however, is of course not

* The geology of portions of north-eastern Kansas has been colored on this map from information kindly furnished by Maj. F. Hawn, of Weston, Missouri, U. S. Dep. Surveyor in that region.

For the information respecting the geology of Platte River valley, I am indebted to Mr. Henry Pratten of the Geological Survey of Illinois.

† See several papers by Mr. Meek and the writer in 8th vol. *Proceed. Acad. Nat. Sci., Philada.*

colored with that minuteness of detail attainable where a regular geological survey has been made. It is therefore probable outliers of the Tertiary formations may exist at a few points where the color would indicate the presence of the older strata upon which they repose. It may also be the case that in some instances valleys have been excavated through the Tertiary so as to expose the Cretaceous strata, at a few localities near the junction of those systems which I have colored as Tertiary. Where any of the colors end abruptly against black spaces, I merely mean to indicate that the formation is known to extend that far, without pretending to say it may not occupy a greater area in that direction.*

As meagre as this map may appear, it is hoped it will not be considered void of interest, when it is borne in mind that it represents the geology of a country about much of which comparatively little accurate information has been published, and the most conflicting opinions are entertained. As an evidence of this, it is only necessary to state that in a comparatively recent publication issued under the sanction of the Geological Society of France, the author, with nearly all that had been published respecting the geology of this country before him, colors almost the whole of this area, which is now well known to be occupied by Cretaceous and Tertiary formations, as Triassic and Jurassic.

Respecting the section, it is perhaps only necessary for me to state, that so far as it represents a profile of the country, it has been constructed from the most reliable Barometrical measurements in the possession of the War Department. The relative thickness of the various formations is given from careful estimates, and not from actual measurements; it is believed, however, that they will not be found far from correct.

As a brief history of former explorations in the North West, together with descriptions of the new fossils, are given in another place in this number of the Proceedings, I shall here confine myself to a few general remarks respecting the geological formations represented in the map and section, and leave all details for another occasion.

The rocks of Nebraska Territory, so far as they have been determined, appear to be referrible to four of the great systems, viz. :—

I. CARBONIFEROUS.
II. CRETACEOUS.

III. TERTIARY.
IV. QUATERNARY.

That portion of Nebraska to which my attention has been directed, forms the area or basin drained by the upper Missouri river and its tributaries, but more immediately to the region bordering upon the Missouri itself, commencing at the mouth of the Platte river and proceeding thence to a point near the base of the Rocky Mountains.

SYSTEM I.—CARBONIFEROUS.

Ascending the Missouri river, we have the upper members of the Carboniferous system, or the Coal Measures, very well exposed at the mouth of the Platte, and extending up the river about fifty miles, where they dip beneath the water level of the Missouri. At Florence, seven miles above Omaha city, the bed of the river is formed of these limestones, and this is the last exposure of them which I observed in ascending the river.

It is difficult to estimate with much accuracy the thickness of the different beds, as the yellow marl or "Bluff Formation," a recent deposit, attains a great thickness in this region, concealing the limestone except in a few localities.

* By some mistake of the persons employed in New York to color the map, the little Tertiary basin at the mouth of Judith River, and several small outliers of Tertiary near White River, are colored a much deeper yellow than the deposits of that age on other parts of the map.

A very small exposure of Cretaceous rocks on the Yellowstone, just below the mouth of Power River, was by a similar error left out.

The Coal Measures, when thoroughly studied, will be found to hold an important position among the geological systems of the far West. According to the investigations of Prof. Shallow, they extend down the Missouri river to Lexington, and we may safely say that they occupy that portion of Kansas bordering upon the river, and for a considerable distance into the interior. We have satisfactory evidence of their existence in the vicinity of Fort Laramie, and also that they occupy a considerable area near Great Salt Lake, Utah Territory.

Little is, however, known of the geology of these far western regions; our present information consisting for the most part of isolated facts.

SYSTEM II.—CRETACEOUS.

This system holds a very important position in the North West not only from the vast area which it occupies, but also in consequence of the number, variety, and beauty of its organic remains. The different formations, as they appear in ascending the Missouri, have been separated into five divisions, presenting generally well-marked lithological differences, and for the most part characterized by different species of fossils. I shall first speak of Formation No. 1 of the Vertical Section, presuming, however, that from all the information yet obtained, its geological position is not definitely determined. Thus far the weight of evidence seems to be in favor of its belonging to the Cretaceous System. We will consider it provisionally, therefore, as the lowest member of the Cretaceous System in this region, and as the first of the series of beds of that age seen in ascending the Missouri.

*Formation No. 1 of Vertical Section.**

In the order of superposition, Formation No. 1 rests directly upon the true limestones of the Coal Measures before referred to. Its first exposure seen along the Missouri is at Wood's Bluffs, right bank, about eighty miles above the mouth of the Platte, and it dips beneath the water level of the Missouri, a few miles below the mouth of the Vermilion. Its general character is a coarse grained, friable sandstone, very ferruginous, of a yellow or reddish yellow color, with thin beds of impure lignite and various colored clay. It contains very few fossils, mostly of the genera *Solen*, *Cyprina* and *Pectunculus*, also fossil wood, and numerous impressions of dicotyledonous leaves, similar to the common willow. Its entire thickness is estimated at ninety to one hundred feet, but it may be more. The relation which I suppose this formation holds to one of a similar character near the mouth of the Judith river will be noticed hereafter.

Formation No. 2 of Vertical Section.

This Formation is first revealed in thin outliers below the mouth of Big Sioux river, and on that stream six miles above its mouth it caps the Bluffs, apparently mingling to some extent with the succeeding bed, and containing at this locality large numbers of *Inoceramus problematicus* and fragments of fishes. Near the mouth of Iowa creek and above, it shows itself worthy of a separate position in the series. It is composed of a dark leaden gray laminated plastic clay, containing few fossils, but great quantities of the sulphate of lime in crystals, assuming a variety of beautiful forms. Its greatest thickness is seen five miles below the mouth of James river. At Dorion's Hills it is seen at low water mark. Entire thickness estimated at ninety feet. Fossils, *Ammonites*, *Inoceramus*, *Cytheria*, *Serpula*, *Ostrea* and abundant fish remains.

Formation No. 3 of Vertical Section.

The geographical distribution of this formation and its influence on the scenery render it one of the most interesting on the Missouri. It is first seen in thin outliers near the mouth of Big Sioux river, and becomes quite con-

* See Vertical Section in a paper by F. B. Meek and F. V. Hayden, in this number of the Proceedings of the Academy. 1857.]

spicuous on the summits of the Bluffs ten miles above Iowa creek. At Dorion's Hills it reaches to the water's edge and is the prevailing formation from thence to the foot of the Great Bend, where it passes by a gentle dip beneath the water level of the Missouri. At Dorion's Hills there is a fine section of this bed about eighty feet exposed above the water's edge, containing its most abundant and characteristic fossil, *Ostrea congesta*. In many places, as opposite the mouth of Running Water, it assumes the form of a long series of precipitous bluffs, giving a pleasing variety to the general monotony of the scenery. This is one of the principal characteristic external features of this formation.

The upper portions of this rock is a yellowish and gray calcareous marl, very soft and yielding, so that it is easily cut up into numerous ravines by the temporary streams, and thus the bluffs along the Missouri often present the appearance of a series of cones split from apex to base. The lower stratum, however, is more compact and forms a soft bluish gray limestone.

Though so well developed and covering so wide an area, the middle and upper portions, at least, of this rock can never be made useful for building purposes. Quite soft and friable in places, when detached, it absorbs moisture rapidly and crumbles in pieces. Being a rich calcareous marl, it may be used at some future time as a fertilizer.

The fossils of this formation, though belonging to few species, so far as is yet known, are numerous in individuals. A species of oyster (*O. congesta*) is found in great quantities throughout the bed, and in localities *Inoceramus problematicus* is abundant. Fish remains, though consisting mostly of scales and obscure fragments, are disseminated throughout the deposit, several species of which have already been identified and described by Dr. Leidy. Entire thickness of this bed about one hundred and fifty feet.

Near First Cedar island, a very singular bed makes its appearance superimposed on No. 3, which we shall consider as probably forming a local upper member of that formation. It extends up the Missouri river to a point near the Great Bend, a distance of about eighty miles. Lithologically it is a dull black, unctuous clay, destitute of any grit, and does not effervesce with an acid. It contains some carbonaceous matter and great quantities of Selenite in crystals.

Formation No. 4 of Vertical Section.

This Formation is the most important one in the Cretaceous System of the North West, not only in regard to its thickness and its geographical distribution, but also in its influence on the topographical features of the country. It is only second in interest to the succeeding bed in the number, beauty and variety of its organic remains. Commencing about ten miles above the mouth of James river, where it is seen only in their outliers capping the distant hills or bluffs, it continues gradually assuming a greater thickness as we ascend the Missouri until reaching the Great Bend, where it monopolizes the whole region, giving to the country underlaid by it a most gloomy and sterile aspect. At the Great Bend it attains a thickness of two hundred feet, and continues to occupy the country bordering on the Missouri to the mouth of Grand river, where, in consequence of the dip of the strata, it passes gradually beneath the water level of the river.

After dipping beneath the water level between Grand and Cannon Ball rivers, this formation again rises to the surface about thirty miles below the mouth of Milk river, (far up towards the sources of the Missouri,) by a reversed dip of the strata from beneath the northern portion of the Great Lignite Basin, as will be seen by reference to the section on the map. Near the mouth of the Muscle Shell river it occupies the whole country for a distance of about eighty miles, and thins out upon the tops of the hills near the mouth of the Judith river.

On the Yellow Stone I observed Formation No. 4 in but one locality, about eighty miles above the mouth of that river. It does not attain a great thick-

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ness, and is probably a ridge left after the denudation of the Cretaceous strata previous to the deposition of the Tertiary. Neither the Cretaceous beds, nor the Tertiary that overlies them, exhibit in this vicinity any evidences of upheaval. The Cretaceous strata here have an extent of only about eight miles, and are exposed only along the banks cut by the river, yet in that space they reveal the remains of marine mollusca in a profusion which I have seen in no other locality. The whole thickness exposed on the Yellow Stone does not exceed twenty-five feet above the water level, and the distant hills on either side are composed of Tertiary beds. At this locality the fossils show a complete blending of this and the succeeding bed, in the ascending series.

We will now return to White or Smoking Earth river below Fort Pierre, and trace this formation into the interior of that interesting region. Passing up the valley of White river, we find it occupying the country bordering upon that stream for about fifty miles above its mouth. Near this point outliers of the White river Tertiary Basin begin to cover the highland, and No. 4 is seen along the river for about twenty miles farther, when it is concealed by Tertiary strata. The intervening country east and north east of the Bad Lands to the Shyenne river, a distance of one hundred and fifty miles, is for the most part underlaid by this bed, except an extension of Fox Ridge, to the sources of the Teton river, which is composed of Formation No. 5 of the Vertical Section. The extensive area drained by the Shyenne river is composed of No. 4, excepting the sources of a few of its tributaries. Sage and Bear creeks take their rise in the White river Tertiary Basin, but flow mostly through this Formation, revealing large quantities of Cretaceous fossils. A few small tributaries have their origin in the Fox Ridge, and Cherry river has its source in the Lignite Tertiary Basin, near the head waters of the Little Missouri.

In summing up the extent of country underlaid by this great formation, we find that south of the Lignite Basin, it occupies an area of two hundred miles in length and one hundred in breadth, or twenty thousand square miles. North of the Great Lignite Basin, commencing at its first appearance near Milk river, we find it covering an area of two hundred miles in length and sixty in breadth, or about twelve thousand square miles. I have been thus particular in estimating its approximate limits and extent of surface on account of its influence on the future destiny of that region. Wherever this deposit prevails it renders the country more completely sterile than any other geological formation I have seen in the north-west. We see from the above estimate that it renders barren over thirty thousand square miles of the valley of the Missouri.

The fossils of this formation are too numerous to mention in detail. The upper and lower members appear to be exceedingly fossiliferous, while the intervening portions of considerable thickness contain only a few imperfect specimens of *Cephalopoda* and the bones of *Mosasaurus missouriensis*. The entire thickness of this formation may be estimated at about three hundred and fifty feet.

Formation No. 5 of Vertical Section.

This very interesting bed, though differing lithologically from the preceding one, contains many of the same species of fossils. It is worthy, however, of a distinct position in the series, not only from its extent, thickness and difference of composition, but also from the more favorable influence that it exerts upon the country underlaid by it. In ascending the Missouri river it first makes its appearance near the mouth of Grand river, about one hundred and fifty miles above Fort Pierre. Near *Butte aux Gres* it becomes quite conspicuous, acquiring a thickness of eighty or one hundred feet, and containing great quantities of organic remains. Here it forms an extension of what is called Fox Ridge, a series of high hills having a northeast and southwest course, crossing the Missouri river into Minnesota at this point. Its north eastern limits I have not ascertained. In its south western extension it continues for a considerable distance nearly parallel with the Missouri crosses the Moreau river about 1857.]

thirty miles above its mouth, then forms a high dividing ridge between the Moreau and Shynenne rivers, at which locality it first took its name. Continuing thence its south westerly course, it crosses the Shynenne, and is seen again in its full thickness at the heads of Opening creek and Teton river, forming a high ridge from which tributaries of the Shynenne and Teton take their rise. The little streams flowing into the Shynenne have a north westerly course, while those emptying into the Teton take a south easterly direction. We thus find that this bed underlies an area of about two hundred miles in length and fifty miles in breadth, or about ten thousand square miles.

The general character of Formation No. 5 is a yellow arenaceous and argillaceous grit, containing much ferruginous matter, and in localities a profusion of Molluscan fossils. It forms a much more fertile soil, more healthy and luxuriant vegetation, sustains a finer growth of timber than Formation No. 4, and abounds in springs of good water.

Like No. 4, this bed yields in the greatest abundance quite perfect and well preserved organic remains. Many of the species approximate so closely to Tertiary forms, that did we not find them everywhere associated with Ammonites, Scaphites and other genera which are not known to have existed later than the Cretaceous epoch, we should at once pronounce the formation in which they occur Tertiary. The whole thickness of this bed is estimated at one hundred to one hundred and fifty feet.

SYSTEM III.—TERTIARY.

This system occupies an extensive area in the country bordering on the Missouri valley. Its wide geographical distribution, its influence upon the topographical features of the country, the mixed and somewhat peculiar character of its organic remains, render its study of the highest interest to the geologist and palæontologist. It seems to occupy depressions in the Cretaceous strata, as is shown in the illustrative section. I shall speak of this system on the Upper Missouri as they occur, or as three distinct basins, the intervening portions being occupied by rocks, which, as far as has been determined, belong to the Cretaceous epoch.

The Basins of this systems are as follows:—

1st.—*Les Mauvaises Terres*, or Bad Lands of White river, which with their outliers occupy an area of from two hundred to two hundred and fifty miles in length and one hundred to one hundred and fifty in breadth. Exact limits not yet ascertained.

2nd.—The Great Lignite Basin, commencing near the mouth of Cannon Ball river and extending nearly to the mouth of the Muscle Shell river, a distance of about six hundred miles. I have traced this formation up the Yellow Stone to the mouth of the Big Horn river, a distance of three hundred miles. Its limits have not been ascertained in several directions.

3rd.—The Bad Lands of the Judith river, which occupy an area of forty miles in length and fifteen to thirty in breadth, reposing upon a sandstone, the age of which has not been positively determined.

Basin 1st.—*Bad Lands of White River.*

This most remarkable lacustrine deposit has been comparatively but recently made known to the scientific world. Wonderful not alone for its unique scenery, but also for the abundance and importance of its organic remains. Even as yet it has been but partially explored, and yet the results that have been obtained have proved of the highest interest. The profusion of Mammalian and Chelonian remains contained in this deposit of species and in most cases genera, though closely allied yet differ from all known living forms, which must render it, when fully explored and studied, classic ground to the geologist and palæontologist. A history of the progress of its exploration up to 1853, with elaborate descriptions of many of its organic remains, may be found in a magnificent memoir entitled "The Ancient Fauna of Nebraska," written by Prof. Joseph Leidy, and published by the Smithsonian Institution.

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In their lithological characters these deposits differ very materially from those of the two succeeding basins, being composed of whitish clays and calcareous and siliceous marls and grits, and entirely destitute, so far as known, of any vegetable remains, except very rare fragments of silicified wood. It is chiefly remarkable as being a vast deposit in which were entombed immense numbers of Mammalian and Chelonian animals, for the beauty and perfection with which their bones have been preserved, and its unique scenery. The few Molluscan fossils which have been found, show most conclusively its purely fresh water origin, being confined to the genera *Helix*, *Planorbis*, *Limnea*, &c. We have also at this time very conclusive evidence that it belongs to the Miocene age.*

The main body of the Bad Lands of White river covers an area of about one hundred miles in length and fifty to sixty in breadth, and it is that portion chiefly which is represented on the map. We have satisfactory evidence, however, from its outliers, that it once occupied a very much larger area, and that it has been removed by denudation. In the section it is represented by Big Ox and Medicine Hills, these localities revealing the only indications of it along the Missouri river. We have also evidence of its existence to a greater or less extent throughout the valley of the Running Water, also that it covers large portions of the country bordering upon the Platte, especially on its North Fork, and a much larger space might be colored on the map, but we have preferred to let it represent what is now known with considerable precision, and wait for the results of future labors to render our knowledge more complete.

Basin 2nd.—Great Lignite Deposit.

This basin occupies a more extensive geographical area on the Missouri than that of the other two united. It has been known since the expedition of Lewis and Clark that a vast formation existed on the Upper Missouri, containing Lignite, &c. Information of a like nature has been published by former explorers since that time, but without details of its lithological characters or collection of its fossils that would enable us to determine its age or extent. The collections of fossils now obtained show most conclusively that it possesses the mixed character of a fresh water and estuary deposit, and that it cannot be older than the Miocene period. It is composed mostly of clays, sands, sandstone and lignites, and has already yielded numerous animal as well as vegetable fossils of great perfection and beauty. It is chiefly remarkable, however, for the evidence that it reveals to us of the variety and luxuriance of the flora of that period. In this respect it differs more especially from the other two deposits.

The extent of country known to be occupied by this basin I have estimated at four hundred miles in length and one hundred and fifty in width, or about sixty thousand square miles. We thus come to an approximate idea of the immense area occupied by this formation, though I am satisfied that when it is thoroughly studied it will be found that the above estimate is much too low.

Basin 3rd.—Bad Lands of the Judith.

This exceedingly interesting deposit occupies a depression in a sandstone formation which rises to the water level at the mouth of Little Rocky Mountain creek from beneath the well-known Cretaceous bed No. 4 of the Vertical Section. It presents perhaps the most rugged scenery on the Missouri river, the denudation and erosion having been much greater than at the Bad Lands of

* See a paper by Prof. Leidy in the Proceedings of the Academy for March, 1857, also the succeeding paper by F. B. Meek and F. V. Hayden, in this number of the Proceedings.

White river. But the most remarkable feature of this basin is the wonderful disturbance of the strata. So much are the beds disturbed and blended together by forces acting from beneath, that it seems almost hopeless to obtain a section showing with perfect accuracy the order of superposition of the different strata.

The lignite beds throughout this basin, though well marked, are of so earthy a character as to have ignited spontaneously in but few places. Indeed the impurity of the lignite forms the most essential lithological difference between this deposit and the Great Lignite Basin below Fort Union. In some places metamorphic rocks have been thrown up through the entire thickness of the strata. Some remarks upon the age of this deposit will be found in a succeeding paper by F. B. Meek and the writer.

FORMATION NO. 1? OF THE GENERAL SECTION,

As seen near the mouth of Judith river.

Although the formation of which I am about to speak has already revealed many important facts, the organic contents of its strata differ so materially from those of any other with which I am acquainted in the North West, that we are unable to fix with certainty its position in the geological scale. From its lithological characters we may refer it to No. 1 of Vertical Section, no difference being seen more than would be expected from their widely separated geographical positions. These facts have already been published in the Proceedings of the Philadelphia Academy of Natural Sciences, from which I extract the following paragraph:*

"In our section of the Nebraska formations, given in a paper published in the 8th vol. of the Proceedings of the Academy, page 63, it will be remembered we placed provisionally the beds of sandstone and clay composing formation No. 1, seen at the Mouth of Big Sioux river and below there, along with the Cretaceous strata, stating at the same time that they were not positively known to belong to that system. We still think it barely possible these beds may be older than Cretaceous, though if represented, as we think they are, by similar beds seen holding about the same position near the mouth of Judith river, far up towards the sources of the Missouri, we must either refer them to the Cretaceous system, or admit the introduction of the genus *Baculites* before that epoch, as we have fragments of a small species of that genus from the Judith river beds. At the same time it should be borne in mind that these strata at the last named locality are characterized by a group of fossils remarkably distinct from those in the rocks above, and that one species belongs to the genus *Hettangia*, a type of bivalves, not known to occur, in the old world, in more modern formations than those of the age of the Lias. If not older than Cretaceous, we think, from these facts, as well as from the stratigraphical position of these beds, they probably represent some of the older members of that system."

Although all our information as yet obtained respecting this sandstone formation is obscure, we have indications that when thoroughly studied, it will prove one of the most important and widely distributed in the far West. From all the evidence I can obtain after a careful study and comparison of these beds, with the minute descriptions of Sir John Richardson, and still later those of Mr. Isbister, I am led to believe, with some confidence, that this formation is but a southern extension of the great lignite formations mentioned by those gentlemen as stretching along the eastern slope of the Rocky Mountains, far northward to the Arctic sea. Though, as suggested in a former paper by Mr. Meek and me, some of these lignite deposits in the north western portions of the British possessions may belong to the Tertiary epoch.

* See a paper by F. B. Meek and F. V. Hayden, in Proc. Acad. Nat. Sci. November, 1856

EXPLORATIONS UNDER THE WAR DEPARTMENT.

Descriptions of new Species and Genera of Fossils, collected by Dr. F. V. Hayden in Nebraska Territory, under the direction of Lieut. G. K. Warren, U. S. Topographical Engineer; with some remarks on the Tertiary and Cretaceous formations of the north-west, and the parallelism of the latter with those of other portions of the United States and Territories.

BY F. B. MEEK and F. V. HAYDEN, M. D.

(Communicated by permission of the Secretary of War.)

Most of the fossils, and many of the notes and memoranda upon which this paper is based, although collected previous to the presentation of our last communication to the Academy, arrived in the States since that paper was in print. Consequently, we have now not only the means of adding many new and interesting species to the list of ancient mollusca previously known from Nebraska, but the late explorations of Lieut. Warren have also brought to light some additional information in regard to its general geology, which we have embodied in the following remarks.

Before presenting these facts and conclusions, justice to former explorers requires that we should at least give a brief statement of the results of such expeditions as have contributed to the development of the geology of this region.

The first reliable accounts we have of the general physical characters of the upper Missouri country, were given to the world in the report of Lewis and Clark's expedition to the Columbia in 1804—5—6. The explorations of these gentlemen, in addition to bringing out a large amount of information of a different character, established the fact of the occurrence of Cretaceous rocks at the Great Bend of the Missouri below Fort Pierre, and of the existence of what was supposed to be "stone coal" (Lignite,) in the Mandan country. Various beds of clay, sand, sandstone, &c., were mentioned in their report, but without any suggestions respecting their age.

In 1832, the Prince of Neu Wied and party also ascended the Missouri to its sources; and the results of his explorations, embodying a great amount of highly interesting information respecting the geography, natural history, &c., of the country explored, has been published in the form of a large quarto volume, accompanied by a magnificent folio atlas of plates, illustrating the scenery of the country, and the manners and customs of its native tribes, in a style of art rarely equalled on this side of the Atlantic. Respecting the geology of the country, however, the Prince's expedition added little of importance beyond the discovery of *Mosasaurus Missouriensis*, to the results of Lewis and Clark's expedition.*

Mr. Nicolle, the well known Geographer, visited this country in 1839, ascending the Missouri to Fort Pierre, and making on his way up a fine collection of Cretaceous fossils at the Great Bend.† Although passing rapidly through the country, he formed a tolerably correct idea of its geology, and gave in his report a vertical section of the Cretaceous rock seen below Fort Pierre, which is correct, excepting that he seems to have had no knowledge of No. 2, and as we think, without sufficient reason, represented two of the subdivisions of No. 3 as distinct formations; No. 1 he appears to have referred to the carboniferous system. As he did not go above Fort Pierre, he probably saw nothing of No. 5, though some of its characteristic fossils were presented to him by gentlemen connected with the Fur company.

* The Prince lost nearly all of his geological specimens by the burning of the Company's steam boat.

† These, together with others given to him at Fort Pierre, were investigated by Morton, and published in the Jour. Acad. Nat. Sc. Philada., Vol. 8, p. 207.

In 1843, Mr. Edward Harris, who accompanied the distinguished Ornithologist Audubon to the mouth of Yellowstone River, brought back specimens from various localities along the Missouri River, some of which verified the statements of former explorers, while others gave evidence of the existence of a fresh-water formation near Fort Union.

At various times after this, specimens of mammalian remains were brought in by gentlemen connected with the American Fur Company, indicating the existence of an interesting tertiary deposit on White River; the first account of which was published by Dr. H. A. Prout, of St. Louis, in the American Journal of Science, 1847.

In 1849, Dr. John Evans, one of Dr. Owen's assistants in the geological survey of the Chippeway Land District, was sent by that gentleman on an expedition to the Mauvaises Terres of White River, and brought back a fine collection of Mammalian and Chelonian remains, which were investigated by Prof. Leidy, of Philadelphia. He also collected at the Great Bend, Sage Creek, and Fox Hills, many interesting Cretaceous fossils, which were investigated by Dr. D. D. Owen, and published in his final report in 1852. Dr. Evans' observations, embracing a section of the Bad Lands, together with a description of their physical features, were also published in this report.

In the following year Mr. Thaddeus A. Culbertson visited the Upper Missouri country under the auspices of the Smithsonian Institution, during which expedition he collected some interesting vertebrate remains from the White River formations. He also ascended the Missouri on the Fur Company's boat to a point above Fort Union, noting the character of the face of the country, and the occurrence of lignite beds at various localities.

In the spring of 1853, Dr. Evans again visited this country incidentally, while on his way to Oregon Territory, in the geological survey of which he was engaged, under the patronage of the general government. During this expedition he made another extensive collection of vertebrate remains, and some fresh-water mollusca at the Bad Lands of White River, as well as some interesting Cretaceous fossils from Sage Creek. The mammalian remains of this expedition were studied by Prof. Leidy, and the other fossils by Dr. Evans and Dr. Shumard, and published in the Proceedings of the Acad. Nat. Sc. at Philadelphia, and the Acad. Sciences of St. Louis.

At the same time (1853) the writers of this paper were employed by Prof. James Hall, of Albany, N. Y., to visit the Bad Lands of White River, for the purpose of making a collection of the Tertiary and Cretaceous fossils of that region. This expedition brought back an extensive and interesting collection of vertebrate remains from the Bad Lands, and of Cretaceous fossils from Sage Creek, as well as from the Great Bend and other localities along the Missouri below Fort Pierre. The first were investigated by Prof. Leidy, and published in the Proceedings of the Acad. Nat. Sc. at Philadelphia; and the latter by Prof. Hall and one of the writers,* and published in the Transactions Acad. Arts and Sciences, Boston.

In this latter paper a brief vertical section of the rocks seen during the expedition, and a complete list of all the mollusca then known from the Cretaceous and Tertiary rocks of that country, were given. The fact that the fossils characterizing the Cretaceous formations of Texas and New Mexico belong to different types from those occurring in the northwest, was also in this paper made known for the first time, in the following words: "Among all the collections made in Texas by Dr. Roemer and others, and of all those brought by the Boundary Survey Expedition, and other surveying and exploring parties, which we have seen, there is but a single species which we regard as doubtfully identical with one from Nebraska. This is *Inoceramus Barabini*, Morton, (L. Crispin, Mantell (?))."

A summary of the leading results of this expedition, throwing light upon

* Mr. Meek.

the general geology of the country, its soil, scenery, &c., was likewise given to the public by Prof. Hall, in an interesting paper read before the American Association for the Advancement of Science, at the Providence meeting.

Subsequent to all these expeditions, one of the writers* again visited Nebraska, and spent two years in traversing various portions of that country; part of which time he was aided by Col. A. J. Vaughan, Indian agent, and afterwards by Mr. Alexander Culbertson, and other gentlemen of the American Fur Company. During this expedition he explored the Missouri to the vicinity of Fort Benton, and the Yellow Stone to the mouth of Big Horn River. Also considerable portions of the Bad Lands of White river, and other districts not immediately bordering on the Missouri. The vertebrate remains collected by him, as may be seen by reference to the various papers by Prof. Leidy in the Proceedings of the Academy, embrace a larger number of species than all those previously known from that country, many of which belong to new and remarkable genera. Large collections of mollusca were also obtained from the Cretaceous and Tertiary formations, and have since been published by us, together with remarks on the general geology of the country, in a series of papers in the Proceedings of the Academy Nat. Sc. Phila. Vol. viii.

Again, in 1856, the same one of the writers returned to that country in connection with a government expedition under the direction of Lieut. G. K. Warren. The new Cretaceous and Tertiary invertebrate remains, together with the new facts in regard to the geology of the country, collected by this expedition, form the basis of this paper.

Up to the publication of our first paper, about fifty-six new species of Cretaceous and Tertiary mollusca had been published from Nebraska, by Drs. Morton, Owen, Evans and Shumard, and by Prof. Hall and one of the writers. Since that time, sixteen additional new species have been published by Drs. Evans and Shumard, making in all seventy-two species hitherto published by others from that country. Our own investigations (including those here described) have made known one hundred and fifty new species, and two new genera, many of the former of which also belong to types not hitherto recognized in this country. Of these one hundred and fifty species, fifty-four (if we include the Judith River, freshwater and estuary species) belong to the Tertiary system, and ninety-six to the Cretaceous. Fifty of the Tertiary species belong to fresh water and land types, and four to genera inhabiting salt and brackish waters; being about four-fifths of all the land and freshwater Tertiary species hitherto made known from American formations. The geological position, and vertical range of all our new species, and several of those published by others from the north-west, as well as a number of the well known and widely distributed forms such as *Scaphites Conradi*, *Ammonites lobatus*, *A. placenta*, *Nautilus Dekayi*, *Inoceramus problematicus*, *Mosasauros Missouriensis*,† &c., have been determined with considerable accuracy; so that we have now the means of tracing out the parallelism between these deposits and their equivalents in other countries.

In a general vertical section of the Nebraska formations given in a paper communicated by us to the Academy in November last, it will be remembered, we represented the White river Tertiary formations as on a parallel with the Eocene, or oldest member of that system. In doing this we merely followed the published views of others, without intending to give it as the expression of an opinion based on any of our own investigations; as all the organic remains yet found in that basin, with the exception of a few freshwater shells described by

*Dr. Hayden.

†In a section of the Nebraska formations accompanying the last paper communicated by us to the Academy, we gave as the position in which the remains of *Mosasauros* occur in the north west, the upper part of No. 5. This was in consequence of erroneous information in regard to the locality from which the specimens given to the Prince of Neu Wied were obtained. The locality (at the Great Bend of Missouri) has since been visited by one of us, and many specimens obtained; they occupy a horizon about the middle of No. 4 of the section.

Drs. Evans and Shumard, belong to the vertebrata, and are consequently out of our line of investigation.

During the later explorations in that region, facts were observed tending to throw doubt upon the conclusion that these formations belong to the Eocene epoch. Among other facts of this nature, we would mention that a friable sandstone seen crowning some of the hills near Moreau River, in which specimens of a *Cyrena* described in one of our former papers (*C. Moreaucensis*) and *Ostrea subtrigonalis* (E. & S.), were found associated with large bones supposed to be those of *Titanotherium*, and which bed we had regarded as probably a distant outlier of the White river formations, was found to be the same as the lowest bed of the Great Lignite basin extending far to the northward.

Now as the *Titanotherium* bed of the White river basin is the oldest member of that series, it must be manifest if the species of the *Titanotherium* occurring at these two localities are really identical, we must either admit the remains of that animal had a great vertical range, which is not the case in the White River deposits, or suppose these two basins are nearly or quite exactly on a parallel.

In addition to the foregoing, some Miocene deposits seen crowning the summits of hills on the east side of the Missouri, near the mouth of White River, were traced by a series of outliers up the valley of the latter stream, to where they were found to pass into the upper part of the well known Mauvais Terres, extending towards the sources of that stream, and which have furnished so many interesting vertebrate remains.

After comparing and discussing these facts we suspected that the whole of the White River basin might be more properly of Miocene than Eocene age, and upon glancing over D'Orbigny's tables showing the vertical range of the various genera of fossil vertebrata, and consulting Pictet's *Traité de Paléontologie*, we observed that several of the old genera to which Dr. Leidy refers the White River *Mammalia* are regarded in the Old World as characteristic of the Miocene epoch. These enquiries, however, being out of our line of investigation, we wrote Prof. Leidy, the distinguished comparative anatomist of Philadelphia, who has so ably investigated all the vertebrate remains hitherto brought from Nebraska, stating our doubts and suspicions respecting the age of these deposits, and requesting him to examine very carefully the large water-worn bones from Moreau and Grand Rivers, occurring in what we knew to be the lowest bed of the Lignite basin, and to inform us if he was quite satisfied they are identical with *Titanotherium Prouti*; also making enquiries respecting the Eocene or Miocene affinities of the various new genera of *Mammalia* described from the Bad Lands of White River by him. Since that time we were much gratified to learn from Prof. Leidy that as much as three or four weeks previous to the reception of our letter, he had arrived at the conclusion, from purely palæontological evidence, that the White River deposits must belong to the Miocene epoch.

Prof. Leidy has presented his views in regard to the Miocene affinities of the vertebrata from the White River formations, in some interesting remarks accompanying a complete catalogue of all the organic remains described by him from Nebraska, recently read before the Academy; a copy of which he has kindly placed in our hands in advance of the regular issue of the Proceedings. From these remarks we extract the following in reference to the fossils from the White River basin:

"*Oreodon*, *Agriochoerus*, *Pæbrotherium*, *Leptomeryx*, *Leptauchenia*, *Protomeryx*, *Merycodus*, *Titanotherium*, *Leptochærus*, *Hyracodon*, *Merychippus*, *Ischyromys*, *Palæolagus*, *Eumys*, *Dinictis* and *Leptarctus*, are peculiar, extinct mammalian genera, from the Tertiary formations of Nebraska, which have heretofore been generally viewed as belonging to the Eocene period, but from their affinities, the associated genera, and the absence of others so common in the Eocene deposits of Europe, I suspect rather belong to the Miocene period. The first seven genera above mentioned are true ruminants, with teeth constructed upon the same type

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as those of living ruminants; a type which is not found in the Tertiary deposits of Europe and Asia, earlier than the Miocene period.

Entelodon, *Palæochærus*, *Rhinoceros*, *Hipparion*, *Stenofiber*, *Amphicyon*, and *Machairodus*, are common to the Nebraska Tertiary deposits and to the Miocene and later Tertiary deposits of Europe; and they have not been found in the Eocene formations of the latter continent.

Of the genera *Anchitherium*, *Hyopotamus* and *Hyænodon* species are found common to the Nebraska Tertiary deposits and the European Eocene and Miocene deposits.

Remains of *Palæotherium*, *Anoplotherium* and *Lophiodon*, so common in the Eocene formations of Europe, are entirely absent from the Nebraska Tertiary formations.

Titanotherium of Nebraska most nearly approaches the Miocene *Chalicotherium* of Europe and Asia.

The rodents *Ischyromys*, *Palæolagus* and *Eumys*, most closely approach the *Arctomys*, *Lepus* and *Mus* of European Miocene and later deposits.

Very numerous remains of *Testudo* are found in association with the Nebraska Tertiary mammals; and extinct species of the same genus belong generally to the Miocene and later deposits of Europe."

From all the foregoing facts, the Miocene age of these White River formations may, we think, be regarded as established, both by palæontological and stratigraphical evidence. There are, however, many points of interest in regard to the exact parallelism of these deposits with those of the Great Lignite basin, yet unsettled. If it be true that the large bones previously referred to in both basins, do really belong to the same species of animal, it would seem, from the fact that they occur in the lowest bed of each, that the two basins are not merely both Miocene, but exactly on a parallel. If so, it is very difficult to account for the fact that, out of the numerous organic remains hitherto found in the two deposits, not a single species, excepting *Titanotherium Prouti*,* should be common to both; especially when we bear in mind the fact that the two basins approach to within forty or fifty miles of each other.

It is true, several of the *Mollusca* occurring in the bone bed, or lowest stratum of the Lignite basin, belong to genera only found in salt or brackish waters, and that none but terrestrial and fresh-water types have yet been found in any part of the White River deposits; thus indicating that one is a lacustrine formation, and the other an estuary deposits; conditions, it is true, not very favorable to the existence of the same species of *mollusca*, but hardly sufficient, we think, to account for the fact that all the shells hitherto collected from the lignite formations are not merely different species from those described by Drs. Evans and Shumard, from the White River beds, but belong to slightly different types.

The entire absence, so far as we yet know, of the fossil plants occurring in such great abundance in the Lignite formations, in those of the White River basin, is also worthy of note; while the lithological differences between the two deposits are well marked. The latter point of difference will be more obvious on comparing the following section of the Lignite formations taken by one of us,† at a locality thirteen miles above Fort Clark, on the right bank of the Missouri, with the section of the Bad Lands of White River, as given by Dr. Evans in Dr. Owen's Report, page 200.

* Since these remarks were communicated to the Academy, we have been informed by Prof. Leidy that he now rather suspects the large bones here alluded to belong to a huge *Dinosaurian* described by him from these beds, under the name of *Thespesius*. He further states that he had merely referred them provisionally to *Titanotherium Prouti*, from their great size, as none of them he has yet seen show even the articulating extremities.

† Dr. Hayden.

Section of Tertiary beds thirteen miles above Fort Clark.

A	30 feet.	Ferruginous sandy marl passing downwards into variegated argillaceous grits.
B	2 inches.	Seam of impure reddish lignite.
C	10 to 12 feet.	Yellowish-gray friable grit, with numerous argillaceous concretions in horizontal layers, containing beautiful impressions of leaves, like those of <i>Platanus</i> , <i>Acer</i> , <i>Ulmus</i> , &c.
D	3 inches.	Seam of lignite, very much mixed with clay and sand.
E	10 feet.	Yellowish-gray grit, very friable, and containing argillaceous concretions charged with leaves of same species of plants as above.
F	3 inches.	Seam of earthy lignite
G	15 feet,	Yellow and drab clay and friable sandstone, containing argillaceous concretions with remains of plants like those above.
H	4 inches.	Dark reddish earthy lignite.
I	20 feet.	Yellow arenaceous grit—very friable—no fossils seen.
J	15 feet.	Alternations of lignite and clay. This bed is variable in thickness, as well as in the proportions of the materials, at different localities.
K	40 feet.	Heavy-bedded gray and ferruginous friable sandstone, containing <i>Melania Nebrascensis</i> , <i>Paludina multilineata</i> , <i>Bulimus limneiformis</i> , <i>Corbula mactriiformis</i> , &c. &c.
L	2 feet.	Seam of impure lignite.
M	4 feet.	Gray argillaceous friable grit.
N	2 feet.	Lignite—purest in the section.
O	6 feet.	Bluish-gray clay, slightly arenaceous.
P	2 feet.	Rather pure lignite.
Q		Gray Compact, or somewhat friable concretionary sandstone.

The bed Q of this section is here only seen at low stages of the river, and then but a few feet of it is exposed above the water line. Near Long Lake, however,
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and on the Moreau, the entire bed is exposed, and attains a thickness of about thirty feet. At these latter localities it is seen to repose directly upon No. 5, or the most recent member of the Cretaceous system of the north-west, the upper part of which it so nearly resembles in its lithological characters that the line of demarkation between the two can often be only ascertained by the organic remains characterizing each. This fact, together with the general resemblance of many of the fossils found in the upper part of No. 5 of our general section to Tertiary types, would have caused us to doubt the propriety of referring this part of that bed to the Cretaceous epoch, were it not for the presence of *Scaphites Conradi*, and other well marked Cretaceous forms.

From the estuary character of the fossils found in the bed Q of the last section, (*Cyrena*, *Ostrea*, *Melania*, &c.,) and the absence of Cretaceous forms, we think there can be little room to question the propriety of referring it to the Tertiary system. The question, however, in regard to its exact position in that system may yet be regarded as a little doubtful, but the weight of evidence is on the side of the conclusion that it is Miocene. This conclusion is also borne out or strengthened by the general relations at other localities between this bed and those above, in which Miocene fossils occur.

The preceding section, although not representing all the beds of the great Lignite basin, (there being some higher beds seen at other localities,) gives a correct idea of the composition and general structure of these deposits,* and shows how remarkably they differ in their lithological characters from those of the White River basin, in which fine white argillaceous material so largely predominates, and no lignite or remains of plants have been found.

Of the age of the fresh-water and Estuary deposits seen near the mouth of Judith River, we have refrained from the expression of any very decided opinion, in consequence of the fact that they appear to be mingled by upheavals with a series of sandstones, clays, lignite, &c., which we think belong to the same epoch as No. 1 of our general section. Amongst some of the collections investigated by us from these Judith River estuary and fresh-water beds, and published in one of our former papers, we found species of *Paludina*, *Corbula*, &c., so closely related to shells we had from the Great Lignite basin near Fort Clark, that we were for a time in some doubt about the propriety of considering them distinct. In this upper member of the Judith River formations, great numbers of a small oyster occur along with the fresh-water shells of which we have just spoken. This oyster so nearly resembles a species in our possession from the lowest bed of the last section, obtained at a locality near Grand River, that we have not yet seen any characters by which they can be distinguished. We are also inclined to regard these shells as identical with a species described by Drs. Evans and Shumard from Grand River, under the name of *O. subtrigonalis*. There is also, in the fresh-water beds at the Judith localities, a *Unio*, which we think the same as a shell found in the Miocene lignite formations on the Yellow Stone. In addition to these facts, a species of *Trionyx* described by Dr. Leidy, from about the middle bed of the Judith fresh-water deposits, is regarded by that gentleman as identical with specimens from the bed Q, near Long Lake below Fort Clark.

Now as this bed Q, of the previous section at the Moreau, Grand River, and Long Lake localities, beyond all doubt, rests directly upon formation No. 5 of the general section, and forms a part of the Great Lignite series, we would not for a moment hesitate in regarding the deposits of which we have spoken, near the Judith, as Tertiary, were it not for the fact that the saurian and fish remains occurring in these beds, as may be seen by reference to Prof. Leidy's remarks respecting them, are allied to Wealden and older types.

In the midst of evidence of such a conflicting nature, it is of course unsafe to express any very positive opinion respecting the age of these formations. At

*It should be borne in mind, however, that the beds of lignite represented in this section vary much in extent, as well as in purity, at different localities; some of those seen on the Yellow Stone being as much as seven feet in thickness. At Fort Berthold, on the Missouri, a two foot bed is pure enough to be used as fuel.

the same time, as we are strongly inclined to the conclusion that they will prove not merely Tertiary, but about of the age of the lowest beds of the Great Lignite basin, or perhaps a little older, we have therefore placed them provisionally along with the Tertiary beds in the accompanying general section of the Nebraska rocks.

In order to give some idea of the nature and order of superposition of the beds of which we have just been speaking, as well as for the sake of comparison with those of the Great Lignite basin, we give below a section taken at the mouth of Judith River, where these beds are least disturbed, and their stratigraphical arrangement can be best seen.

Section of Fresh-water and Estuary Deposits near the Mouth of Judith River.

A	80 feet.	Yellow arenaceous marl passing downwards into gray grit, with small seams of lignite; contains great numbers of <i>Ostrea subtrigonalis</i> ?, <i>Cyrena occidentalis</i> , <i>Melania conveza</i> , &c. &c.
B	10 feet.	Impure lignite, containing much sand. <i>Ostrea subtrigonalis</i> ? and silicified wood.
C	80 feet.	Alternations of sand and clay, with particles of lignite; also reddish argillaceous concretions with a few saurian teeth, and fresh-water shells.
D	20 feet.	Alternate strata of sand and clay, with impure lignite and silicified wood in a good state of preservation.
E	100 feet.	Variable bed, consisting of alternations of sand and clay with large concretions containing great numbers of <i>Melania</i> , <i>Paludina</i> , <i>Helix</i> , <i>Planorbis</i> , <i>Cyclas</i> , &c. &c., associated with Saurian remains resembling the <i>Iguanodon</i> and <i>Megalosaurus</i> , <i>Trionyx</i> , &c. &c.
F	25 feet.	Alternations of impure lignite and yellowish-brown clay, the latter containing great numbers of <i>Unio</i> , <i>Paludina</i> , <i>Melania</i> , <i>Cyclas</i> , and the fresh remains referred by Dr. Leidy to the genus <i>Lepidotus</i> .
G	100 feet.	Ferruginous sand and clay, having in upper part a seam 3 or 4 inches in thickness, nearly made up of shells of <i>Unio</i> . Lower part ferruginous, and coarse gray grit, with a seam near the base entirely composed of remains of <i>Unio Danai</i> , <i>U. Dewyi</i> and <i>U. subspatulata</i> .

This section embraces all the deposits, as we believe, seen in the Bad Lands of the Judith, in which land and fresh-water shells are known to occur. They appear, as near as could be ascertained, to occupy a local basin in a series of

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marine deposits, consisting of beds of sandstone and impure lignite, which we have regarded provisionally as of the age of No. 1 of our general section.

Lower down the Missouri, near the mouth of Little Rocky Mountain Creek, this last mentioned series of rocks upon which the fresh-water deposits repose at the mouth of the Judith, is clearly seen to pass beneath No. 4 of the general section; proving that Nos. 2 and 3 are not represented in that part of the country. As no indications were seen in this region of these latter formations, it is probably they are entirely wanting towards the sources of the Missouri.

The deposits above alluded to, (at the mouth of Judith River,) as probably on a parallel with beds seen near the mouth of Big Sioux River on the Missouri,—(forming No. 1, of the Nebraska section,)—are characterized, as stated in one of our former papers, by a group of fossils remarkably distinct from those occurring in any of the higher north western formations; and there remains some doubt as to whether or not they are older than Cretaceous. The presence of the genus *Baculites* would seem to establish the fact that they belong to the Cretaceous epoch; while the occurrence in the same hand specimens with these remains of *Baculites*, of a species of *Hettangia*,—a genus of bivalves, not known to occur in the old world in newer formations than the Lias,—would, on the other hand, indicate that these beds are older than Cretaceous. For the present, however, we express no decided opinion on this point, but content ourselves with the remark, that we are inclined to think they hold a position near the base of the Cretaceous system, and are probably on a parallel with the Neocomien of the old world, though they may be older.

The following section, taken near the mouth of Judith River,* will exhibit approximately the lithological characters, and order of succession of these deposits at that locality. It is not pretended, however, that this section represents all the beds of this series, as others were observed near them, but owing to the distortion and disturbance of the strata, and the unfavorable circumstances under which the observations were made, it was impossible to devote time enough to their examination to collect the means of constructing a connected general section of the whole series. We should also state here that the specimens furnishing the data upon which this section, and that of the fresh-water and estuary deposits near the same locality, were constructed, although collected some time back, only came to hand since the communication of our last paper.

SECTION OF THE OLDER DEPOSITS AT THE MOUTH OF JUDITH RIVER, IN THE DESCENDING ORDER.

- Bed A.—Yellowish and reddish, rather coarse grained sandstone, becoming deep red on exposure,—containing *Inoceramus ventricosus*, *Mastra alta*, *Cardium speciosum*, &c., &c. 20 to 25 ft.
- " B.—Mixed pure and impure lignite—whole bed containing many crystals of selenite, and a yellowish substance like sulphur. The masses of lignite, when broken, reveal in considerable quantities small reddish crystalline fragments of a substance having the taste and appearance of rosin... 6 to 8 ft.
- " C.—Variable strata of drab clay, and gray sand and sandstone:—upper part containing large numbers of *Ostrea glabra*. Near the middle, there are gray or ash-colored clays with very hard bluish gray granular, siliceous concretions, containing *Hettangia Americana*, *Panopæa occidentalis*, *Mastra formosa*, &c., ... 80 to 100 ft.

At several points near the locality where the above section was taken, the bed G, of the last section, with its characteristic fossils, was seen superimposed upon the bed A, of the section here given; but the line of junction was not sufficiently well exposed to determine very satisfactorily whether the upper part of these lower deposits bears marks of denudation previous to the deposition of the overlying freshwater and estuary beds or not.

On a former occasion we expressed very briefly our views in regard to the parallelism of the Cretaceous formations of Nebraska with those of New Jersey, Alabama, and portions of the far west and south west. In order to make more clear some of these points of parallelism, we here reproduce for comparison, with some modifications, the general section of the Nebraska formations; and

*By Dr. Hayden.

also give sections of the Cretaceous formations as seen in Alabama and New Jersey. For the Alabama section we are indebted to Prof. A. Winchell, of Ann Arbor, Michigan, who has devoted much time to the study of the Cretaceous rocks of the South. Most of the facts given in this section are contained in an interesting paper read by Prof. Winchell, before the American Association for the Advancement of Science, at the last meeting, held in Albany, N. Y. As here given, however, this section has been constructed from information kindly furnished us by Prof. Winchell, in advance of the printing of the Proceedings of that meeting.

The New Jersey section we have compiled from the reports of Prof. Ketchel and Prof. Cook, Geologist and Assistant Geologist of that State. In the instances where the positions of fossils were not given in the reports above alluded to, we have been guided by information kindly furnished by Prof. Cook, in several communications received from him.

Alabama Section, from facts communicated by Prof. A. Winchell.

	Thickness.	SUBDIVISIONS.	Eq. of the Nebraska Section.	Eq. of the N. Jersey Section.
A	4 feet.	Decomposing dark limestone, with obscure casts of shells.	No. 5.	b. or 2d Green Sand.
	6 feet.	Soft white limestone— <i>Gryphæa vesicularis</i> , <i>Exogyra costata</i> , <i>Scaphites Conradi</i> , <i>Nautilus Dekayi</i> , <i>Baculites ovatus</i> , &c. &c. <i>Ammonites lobatus</i> , Tuomey, (here?)		
B	45 feet.	Loose white sand, with <i>Ostrea larva</i> , <i>Pecten 5-costatus</i> , <i>Gryphæa vomer</i> and fragments of fossil wood.	No. 4.	Beds c, d and e.
C	150 feet or more.*	Soft white limestone, ("Rotten limestone,") decomposing above, more argillaceous below, and near the base becoming a firm calcareous sandstone. <i>Inoceramus biformis</i> of gigantic dimensions, <i>Radialites</i> , <i>Nautilus Dekayi</i> , <i>Ammonites Delawareensis</i> , <i>Baculites ovatus</i> , Shark's teeth, and Mosasauroid remains.		
	6 feet.	Gray indurated sand with <i>Gryphæa vesicularis</i> , <i>Exogyra costata</i> , <i>Inoceramus biformis</i> , <i>Pecten 5-costatus</i> , <i>Teredo tibialis</i> , <i>Ammonites placenta</i> , <i>A. Delawareensis</i> , teeth of fishes, &c. &c.		
D	15 feet.	Perfectly loose obliquely laminated sand, of gray and greenish-yellow color, with thin unconformable lamina of dark green sand passing in horizontal planes through the main bed. Much fossil wood, with <i>Teredo tibialis</i> .		
E	300 feet, may be much more.	Beds of dark blue soft shale, or indurated clay, alternating with strata and seams of white, and mottled clays, green and ferruginous sand, and dark pyritiferous shale. No organic remains but stems and leaves, of apparently dicotyledonous plants, and a few obscure casts of other fossils. <i>Ceratites Americana</i> , however, of Harper, is supposed to hold a position somewhere in this series.	No. 1.	Formation f.

* According to Prof. Tuomey this bed sometimes attains a thickness of 1,000 feet.

NEW JERSEY SECTION COMPILED FROM THE REPORTS OF THAT STATE.

a.	3d bed. G. Sand.	Green Sand.	60 ft.	Tertiary.
		"The sand between the second and third beds has usually been confounded with beach sand, which it closely resembles." 45 or 50 ft.		
b.	2d bed. G. Sand.	Yellow limestone.		No. 5 Nebras.
		Green Sand, <i>Scaphites Conradi</i> , <i>Baculites ovatus</i> , <i>Ammonites placenta</i> .	45 or 50 ft.	
c.		Sand "much colored with oxyd of iron, and when sufficiently firm is found almost full of the impressions of shells." <i>Belemnites mucronatus</i> .	65 or 70 ft.	Represents No. 4 Nebraska
d.	1st bed. G. Sand.	Green Sand, <i>Nautilus Dekayi</i> , <i>Baculites ovatus</i> , <i>Belemnites mucronatus</i> , and bones of <i>Mosasaurus</i> .	50 ft.	
e.		Dark clays with "occasional streaks and irregular spots of green sand." <i>Ammonites placenta</i> , <i>Baculites ovatus</i> , &c. &c.	130 ft.	
f.		Dark blue, ash colored, and whitish clays, and micaceous sand, with thin seams of coal. Great quantities of sulphuret of iron "Fossil wood is found in some of the layers in large quantities, and some very distinct impressions of net-veined leaves were examined in the clay at French's landing." 130 ft. or more.		Represents No. 1 of the Nebraska section

By comparing the foregoing sections with the following general section of the Nebraska rocks, the parallelism between the formations, so far as the Cretaceous rocks of the North West are represented in Alabama and New Jersey, will be at once understood.

In the following section of Nebraska rocks it will be observed we have placed together all the Tertiary deposits known to us, without intending to express any opinion in regard to the comparative ages of these formations. We have also written in the column opposite them the word "Miocene;" this, so far as the Judith River fresh water and Estuary formations are concerned, is done provisionally. We have likewise made three subdivisions of formation No. 3. This latter change is made mainly upon lithological differences between what we regard as probably subordinate members of the same formation. The upper or dark bed of very fine argillaceous matter, passes both downwards, and at some points, horizontally into the gray marl below it, and appears to be local, while the gray marl, in its turn, passes imperceptibly into the light colored limestone below.

It is due to the lamented Mr. Nicollet that we should state here, he saw the two beds above mentioned, and noticed their differences in his report; but in consequence of the fact that he referred the *Inoceramus* occurring in the limestone (*I. problematicus*) to *I. Barabini*, a fossil not known below No. 4 and 5 of the section, if indeed it occurs at all in the Nebraska beds, we were always at a loss to understand his section. In addition to this, neither of us had ever visited localities where this bed or the dark deposit forming the upper part of No. 3 is exposed, previous to the late explorations.

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Vertical Section of the Geological Formations of Nebraska Territory, so far as determined.

SUBDIVISIONS.		LOCALITIES.	Estimated thickness.	
TERTIARY SYSTEM.	MIOCENE.	Light colored indurated clays, with occasional beds of sandstone, conglomerate and whitish limestone. Great numbers of <i>mammalian</i> and <i>chelonian</i> remains, with a few fresh-water and land shells.—(Bad Lands of White River.) Beds of clay, sand, sandstone, and lignite, containing great numbers of fresh-water and land <i>mollusca</i> , with a few marine or estuary shells; remains of plants, <i>Saurians</i> , <i>Trionyx</i> , &c. &c.—(Great Lignite Basin.) Sand, sandstone, clays, and very impure lignite, with remains of fresh-water, land, and a few estuary shell, <i>Saurians</i> , fishes, <i>Trionyx</i> , &c.—(Bad Lands of Judith.)	<i>Mauvoises Terres</i> of White River. Great extent of country on both sides of the Missouri between Heart and Milk Rivers; on the Yellow Stone. Bad Land at the mouth of Judith River, &c. &c.	About 900 feet.
	No. 6.	Gray and yellowish arenaceous clays, and sandstones, sometimes weathering to a pink color; containing <i>Bellerophon bulbosa</i> , <i>Nautilus Dekayi</i> , <i>Ammonites placenta</i> , <i>A. lobatus</i> , <i>Scaphites Conradi</i> , <i>Baculites ovatus</i> , and great numbers of other marine mollusca.	Moreau trading post, and under the Tertiary at Sage and Bear Creeks. Fox Hills.	100 to 150 feet.
CRETACEOUS SYSTEM.	No. 4.	Bluish and dark gray plastic clays, containing <i>Nautilus Dekayi</i> , <i>Ammonites placenta</i> , <i>Baculites ovatus</i> , and <i>B. compressus</i> , with numerous other marine mollusca,—remains of <i>Mosasaurus</i> .	Great area about Fort Pierre and along the Missouri below there. Under No. 5, at Sage and Bear Creeks. Great Bend of the Missouri. Near Milk and Muscle shell Rivers.	350 feet.
	No. 3.	20 ft. Dark, very fine unctuous clay, containing much carbonaceous matter, with veins and seams selenium, sulphuret of iron, fish and scales, (local.) 100 ft. Lead gray calcareous marl, weathering above to a yellowish tint. Scales and other remains of fishes— <i>Ostrea congesta</i> —passing downwards into 30 ft. Light gray or yellowish limestone, containing great numbers of <i>Inoceramus problematicus</i> , fish scales, and <i>Ostrea congesta</i> .	Bluffs along the Missouri, below the Great Bend. Extends to Big Sioux River, and occurs along the latter stream.	150 feet. N. Jersey & Alabama.
	No. 2.	Dark gray laminated clay scales and other remains of fishes, small Ammonites, <i>Inoceramus problematicus</i> ?, <i>Serpula</i> , small oyster-like <i>O. congesta</i> , &c. &c.	Along the Missouri Bluffs, from ten miles above James River to Big Sioux River.	90 feet. Wanting in N. Jersey & Alabama.
	No. 1.	Yellowish and reddish friable sandstone, with alternations of dark and whitish clays. Seams and beds of impure lignite, fossil wood, impressions of dicotyledonous leaves; <i>Solen</i> , <i>Pectunculus</i> , <i>Cyprina</i> , &c. This bed is not positively known to belong to the Cretaceous system.	Near the mouth of Big Sioux River, and between there and Council Bluffs. Near Judith River?	90 to 100 feet, or more.
	CARBONIF. SYSTEM.		Yellow limestone, containing <i>Fusulina cylindrica</i> , <i>Terebratula subtilita</i> , <i>Spirifer Meusebachianus</i> , <i>Alorisma regularis</i> , and other fossils of the coal measures.	Forms shoals in the Missouri River at De Soto; 15 to 20 feet exposed at Council Bluffs, at low stages of the river.

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The position and vertical range of such fossils as are known to be common to the North West and New Jersey, in the foregoing general section of the Nebraska rocks, clearly establishes, as stated in our paper communicated to the Academy in November last, that formations No. 4 and 5 of the North West, are on a parallel with the beds b. c. d. and e. of the New Jersey series.

After a careful review of the subject, we are now satisfied that the parallelism of these beds may be more closely drawn, or in other words, that the second green sand bed of the New Jersey section represents No. 5 of Nebraska, and that No. 4 of the latter region is on a parallel with the beds c. d. and e. of New Jersey.

At the same time the identity of No. 1 of the North West, with the beds composing f. of the New Jersey section, is scarcely less apparent. It is true this latter opinion rests mainly upon stratigraphical and lithological evidence, yet these points of analogy are so strong as to possess great weight. In order that this may be better understood and appreciated, we quote below from notes taken by one of us* in 1855, a description of an exposure of No. 1 seen on Big Sioux River, which will show, by comparison with the New Jersey section, the striking resemblance between the beds holding a position at the base of the Cretaceous formations at these distantly separated localities.

"Six miles above the mouth of Big Sioux River we have an exposure of impure lignite about 12 inches in thickness, underlaid by alternate layers of sandstone, loose clay, yellow and ash colored arenaceous clays, and fine whitish clay. The strata containing clay have quite distinct impressions of leaves, which appear to have belonged to dicotyledonous trees. We have also, near the base of the exposure, some fine impressions of leaves in dark tough gray, siliceous, concretionary rock. Much pyrites and fragments of fossil wood occur in these beds."

The points of analogy between these lower deposits (No. 1) of the north-west, and formation f at the base of the New Jersey section, as well as with an extensive series of deposits holding the same position in Alabama, (formation E of the Alabama section,) and throughout a great area of country in Arkansas, Texas, and New Mexico, will be more fully illustrated by the following section taken in north-eastern Kansas, where this series appears to be more extensively developed than at any localities known to us in Nebraska.

For this section, as well as much other interesting and important information respecting the geology of the country surveyed by him, we are indebted to the kindness of Major F. Hawn, formerly of the geological survey of Missouri, but now connected with the lineal survey of portions of Kansas Territory. We give it exactly as communicated to us by him, excepting that we have thrown it into a tabular form, and added columns showing the parallelism of the beds with those of New Jersey and Nebraska. To those acquainted with Major Hawn, it is unnecessary for us to say he is a careful conscientious observer, whose statements are worthy of the fullest confidence.

The beds represented in this section were not all seen at any one locality, but their thickness, composition and order of succession were determined from examinations made at numerous exposures in the country east of the sixth principal meridian, between the northern boundary of Kansas and the Republican fork of Kansas River.

* Dr. Hayden.

Sections of the rocks in North Eastern Kansas, (above the coal measures).

By MAJOR F. HAWN, U. S. Dep. Surveyor.

		SUBDIVISIONS.			
	Thickness.			Eq. Nebraska section.	Eq. New Jersey section.
a.	45 feet.	Light gray limestone with <i>Inoceramus problematicus</i> and other Cretaceous fossils.	Jurassic of Mr. Marcon.	No. 3. (lower part.)	Wanting in New Jersey.
b.	27 feet.	Slope strewn with light gray calcareous concretions.		No. 12.	
c.	25 feet.	Hard concretionary dark ferruginous sandstone, containing fossil wood, and impressions of leaves resembling those of the common willow.			
d.	90 feet.	Slope with numerous large rounded blocks thinly laminated sandstone.			
e.	10 feet.	White very fine grained soft calcareous sandstone.	Triassic of Mr. Marcon.	Number 1.	Formation f. of New Jersey section.
f.	5 ft.	Soft thinly laminated dark blue clay.			
g.	12 feet.	White clay, stained in spots with oxyd of iron.			
h.	28 feet.	Slope with large irregular blocks of hard dark ferruginous sandstone, containing large quantities of fossil wood and leaves, like those of <i>Quercus alba</i> .			
i.	50 feet.	Soft coarse buff sandstone, rapidly disintegrating where exposed.		Formation E.	
j.	30 feet.	Light blue clay.			
k.	14 feet.	Slope strewn with rectangular blocks soft, dark brown, fine grained sandstone.			
l.	60 feet.	Slope, upper part covered by loose flags of dark ferruginous conglomerate, composed of coarse sand and small silicious pebbles.			
m.	48 feet.	Light gray and buff irregularly stratified silicious limestone, probably of Carboniferous age.			

The similarity between the beds from c. to l. inclusive, of the above section, and formation f. of the New Jersey series, when taken in connection with their position in relation to the higher formations, is too obvious to leave much room to doubt that they belong to the same horizon.

Mr. Henry Pratten, of the Geological Survey of Illinois, to whose liberality we are indebted for a full abstract of notes taken by him on the geology of the country along the California trail between Fort Leavenworth and San Francisco, informs us that he met with the lower members of the Nebraska section at several points along Platte River, above Fort Laramie. No. 1, he says, as in portions of north-eastern Kansas, and on the Missouri below the Big Sioux, reposes directly

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upon upper Carboniferous strata, and presents its usual characters, excepting that the beds of sandstone are more frequently white. He did not see No. 2 well exposed, its place in the series being usually occupied by a slope. Above this, however, he saw the lower beds of No. 3, presenting their usual lithological characters, and containing the fossil everywhere marking this horizon, (*Inoceramus problematicus*.)*

Mr. Hawn writes us, he has been informed by an intelligent Deputy Surveyor, that the formations represented in his section, especially the beds below the upper limestone, were seen by him at intervals along the sixth principal meridian, as far south as his survey extended, or to the fifth standard parallel, near the Arkansas River.

Exactly similar deposits were observed by Dr. George B. Shumard in the vicinity of Fort Washita, and the Cross Timbers in northern Texas. He describes these formations as consisting of "grayish yellow sandstone, with intercalations of blue, yellow and ash colored clays, and beds of white and bluish-white limestone. The limestone reposing on the clays and sandstones." (See Capt. Marcy's report of Explorations on Red River, page 181.)

In one of the upper beds of this series Dr. Shumard found, along with several new species of Cretaceous fossils, some of the same shells collected by Dr. Rømer from similar deposits at New Braunfels, and other localities further south in Texas. He likewise collected from the same beds, species identical with some of those found in the same position by Mr. Marcou at Pyramid Mountain, in New Mexico, thus establishing the parallelism of the formations at all these localities.†

A section of these deposits taken by Mr. Marcou at Pyramid Mountain, near the Llano Estacado, (Bulletin Geol. Soc. France, Tome 12, p. 878,) corresponds remarkably in its general features with Mr. Hawn's section already given, of these formations in north-eastern Kansas. The identity of composition and order of succession of the various beds represented in these sections, can scarcely be due to accident, but points rather to the conclusion that they were deposited at the same time in the same ocean.

For the sake of comparison we give below, in a tabular form, Mr. Marcou's section of Pyramid Mountain, with columns showing the parallelism of the various beds with the formations in Nebraska, Kansas, New Jersey and Alabama, as well as his views respecting the parallelism of the same with formations of the Old World.

* Since these remarks were written, I have received with deep regret the sad news of Mr. Pratten's death. In making this announcement, it affords me a melancholy pleasure to bear witness to his merits as a man and a devoted cultivator of natural science. Along with all the artless simplicity of a child, he possessed an intellect of no ordinary powers; while his studious habits and untiring perseverance, aided by a wonderful memory, had enabled him, under circumstances far from propitious, to acquire an amount of knowledge in various departments of science, of which the most favored might be proud. Perhaps no person now living possesses a better knowledge of the western carboniferous fossils than he did; and yet this was only one of several branches of science to which he had devoted many years of his life. His quiet habits and unpretending manners, however, had to a great extent prevented his real merits from being duly appreciated outside of a comparatively limited circle of personal acquaintances. With all, and better than all, his other qualities of head and heart, Mr. Pratten was a high minded, honorable man.

F. B. M.

† I am under obligations to Dr. B. F. Shumard for a few specimens of fossils collected by his brother from these formations in Texas.

F. B. M.

Section of the Formations at Pyramid Mountain, New Mexico.

Thickness.	SUBDIVISIONS.	Eq. Nebraska Section.	Eq. N. Jersey Section.	Eq. Alabama Section.
a 5 or 6 ft.	White, very compact silicious limestone.	No. 3, lower.	Wanting in N. J.	Wanting.
b 5 or 6 ft.	Hard, deep yellow gritty limestone.			
b 30 feet.	Bluish-gray clay of subschistose structure, containing near the base a species of <i>Gryphaea</i> and <i>Ostrea</i> , (referred by Mr. Marcou to <i>G. dilatata</i> and <i>O. Marshii</i> .*)	No. 2.		
c 25 feet.	Fine grained, white sandstone, disintegrating rapidly where exposed.	NUMBER 1.	FORMATION F.	FORMATION E.
d 80 feet.	Hard, fine grained sandstone of a light yellow color, forming perpendicular escarpments.			
e 8 feet.	White, fine grained sandstone.			
f 200 ft.	Alternations of red, green and white marly clays.			

Mr. Marcou does not mention the occurrence of *Inoceramus problematicus* in the limestone (a) of his section at this locality, but it has been found in this position at various localities in the south-west by others, as stated in our last communication. From the facts given by him, there is also scarcely room for a doubt, but the specimen of *Ostrea congesta*, we mentioned seeing in his collection† (Proceed. Acad. Nat. Sci. November last) from Galisteo, was either found in this bed or the clays immediately below it, (b of his section,) in both of which deposits it occurs in Nebraska.

As Pyramid Mountain is but an isolated portion, left by the denudation of the surrounding strata, of a great elevated plateau known as the *Llano Estacado*, which occupies a vast area of country in western Texas and New Mexico, it is highly probable the beds composing Mr. Marcou's section are widely distributed

* We think these identical with species found by Dr. George B. Shumard at Fort Washita, Texas, where they appear to hold the same geological position, and are associated with *Ammonites vespertinus* (Morton.) Dr B. F. Shumard has correctly, as we believe, referred the first to *Gryphaea Pitcheri* (Morton), and described the latter as a new species, under the name of *Ostrea subovata*. (See Capt. Marcy's Report Explorations Red River, page 205—Appendix.) We are almost willing to hazard the opinion, that these species will yet be found in Southern Nebraska, or north-eastern Kansas, in formation No. 2 of the Nebraska Section.

† In alluding to this fact in our last paper, we inadvertently omitted to mention that the specimen seen by us is in the possession of Prof. Hall, by whose permission we referred to its occurrence at that locality.

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over the far south-west. This conclusion is also borne out by the statements of Capt. Marcy and other explorers of that region. The facts given by this gentleman and Dr. G. G. Shumard, likewise point to the conclusion that the great gypsum deposits of the south-west hold a position equivalent to No. 2, or the upper part of No. 1 of the Nebraska section.

From all the facts, we are led to believe, as stated on a former occasion, that the divisions No. 4 and 5 of Nebraska, and their equivalents in New Jersey and Alabama, are entirely wanting, or but meagrely represented, throughout the south-west; and that No. 2 and No. 3 are the main fossil-bearing strata of that region; while No. 1, which there as in the north-west and in Alabama, reposes on Carboniferous strata, attains a much greater development than in either of those countries.

CONCLUSIONS.

1st. We have no evidence that any of the Tertiary deposits now known in Nebraska are older than Miocene.

2d. The estuary and fresh-water deposits at the mouth of Judith River are probably on a parallel with the lowest bed of the Great Lignite basin, though some portions of them may be somewhat older.

3d. The Great Lignite basin and the *Mauvaises Terres* of White River, though probably both Miocene, are not exactly on a parallel.

4th. We have in Nebraska a more complete series of Cretaceous formations, and consequently a better standard of comparison for rocks of that age, than is yet known to exist in any other portion of this country.

5th. The formations in New Jersey and Alabama generally referred to the Cretaceous system, are on a parallel with the *upper* and lower members of the Nebraska section, (No. 1, 4 and 5;) while nearly, if not quite all the main fossil-bearing deposits older than Tertiary, and newer than Carboniferous, in Kansas, Arkansas, Texas and New Mexico, are on a parallel with the *middle* and lower portions of the same.

6th. Although the beds No. 2 and 3 of the north-west, are extensively developed, and probably the principal fossiliferous Cretaceous deposits of the far south-west, we have up to this time, no evidence of their existence east of the Mississippi. Consequently the marked typical differences observable between most of the Cretaceous fossils hitherto found in the south-west, and those characterizing the upper Cretaceous formations of Nebraska, Alabama and New Jersey, are not wholly due to the fact that they belonged to different zoological districts; nor yet, as might be supposed in regard to the Nebraska and New Jersey species, to the modifying effects of physical conditions dependent on latitude; but mainly to the fact that they belong to another geological horizon, and consequently lived during a different epoch.

7th. There is at the base of the Cretaceous System, at distantly separated localities in Nebraska, Kansas, Arkansas, Texas, New Mexico, Alabama and New Jersey, if not indeed everywhere in North America where that System is well developed (at any rate east of the Rocky Mountains), a series of various colored clays and sandstones, and beds of sand, often of great thickness, in which organic remains, excepting leaves of apparently dicotyledonous plants, fossil wood, and obscure casts of shells, are very rarely found, but which everywhere preserves a uniformity of lithological and other characters, pointing unmistakeably to a similarity of physical conditions during their deposition, over immense areas.

8th. Although the weight of evidence thus far favors the conclusion that this lower series is of the age of the lower Green Sand, or Neocomien, of the old world, we yet want *positive* evidence that portions of it may not be older than any part of the Cretaceous System.

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DESCRIPTIONS OF NEW FOSSILS.*

PTYCHOCERAS MORTONI.

Shell small and thin, elongate cylindrical; larger half, or body, very slightly tapering, apparently rounded on the dorsum, and concave along the inner side for the reception of the slender smaller half. Surface ornamented by rather strong annular costæ, which are less prominent, and somewhat irregularly divided on the body, and bifurcate occasionally on the smaller part; dorsum of the slender half ornamented by two rows of very small nodes, arranged upon the costæ; fine indistinct lines of growth mark the shell parallel to the ribs. Aperture, septa, and siphuncle unknown. Length (of specimen imperfect at the aperture, and apex of smaller portion) about 1 inch; breadth .26 inch; diameter of slender part .12 inch; do. of body .17 inch.

This shell is about the size, and has much the general appearance of a species described by Dr. Morton from the deep cut of the Chesapeake and Delaware canal, under the name of *Hamites annulifer* (Jour. Acad. Nat. Sci. vol. 8, pl. xi. fig. 4,) but differs from his figure in having bifurcating instead of simple costæ. It is possible, however, that they may not be distinct, though it is hardly probable so important a character as the bifurcation of the costæ would have escaped the attention of so close an observer as Dr. Morton.

Judging from the nodes seen along the dorsum of the smaller portion of our shell, it appears probable similar or stronger nodes may have existed along the outside of the body, or larger half; if so, it must have differed materially in this respect from Dr. Morton's species. When entire our specimen must have been not less than $1\frac{1}{2}$ to 2 inches in length.

Dedicated to the lamented Dr. George Morton of Philadelphia.

Locality and position. Great bend of the Missouri, formation No. 4. of the series.

SERPULA? TENUICARINATUS.

Shell growing in groups, or rarely single, slightly compressed-cylindrical, increasing very gradually in size, irregularly curved or flexuous, not spirally coiled; attached by one side nearly the whole length; having a distinctly elevated, linear carina along the upper side; surface sometimes very obscurely undulating transversely, otherwise smooth. Length unknown; transverse diameter about .14 inch.

As we have no perfect specimens of this fossil, it is with some doubt we refer it to the genus *Serpula*. It appears to have no internal septa as in *Vermetus*; and we have seen no indications of an operculum as in *Vermicularia*; consequently we place it provisionally in the genus *Serpula*.

Locality and position.—Mouth of Vermillion River, on the Missouri, formation No. 2 of the series.

VITRINA OBLIQUA.

Shell obliquely oval; spire much depressed; volutions four to four and a half, first two or three increasing rather slowly in size, last one ventricose and rapidly enlarging, prominent below; suture distinct; aperture circular; surface unknown. Greatest transverse diameter .64 inch; height .50; diameter of aperture .37 inch.

Having seen only internal casts of this shell, we are in some doubt about its generic relations; as its associates, however, belong to land and freshwater genera, and its form agrees very nearly with that of *Vitrina*, we place it provisionally in that genus. It resembles a species described by Reuss and Von Meyer, under the name of *V. intermedia* from the Tertiary Lacustrine deposits in the north of Bohemia, (see Tert. Süss. pl. 1 fig.) but has more volutions.

Locality and position. Mouth Judith River, bed E of the section of freshwater and estuary deposits at that place.

* Illustrations to be published hereafter in Lieut. Warren's Report.

HELIX OCCIDENTALIS.

Shell thin, rather small, depressed nearly orbicular; volutions four, convex above, prominent, or almost subangular a little above the middle of the outside, gibbous below, most convex near the umbilicus; surface ornamented by regular rather strong oblique lines of growth; suture well defined; umbilicus deep, less than one third the transverse diameter of the shell, exhibiting most of the inner volutions; aperture round oval, modified slightly by the succeeding whorl; lip sharp, not reflexed. Greatest transverse diameter .33 inch; height .21 inch; greatest diameter of aperture .16 inch.

This neat little Helix is more nearly related to the recent *H. striatella* of Anthony than to any other shell we have seen figured, but is larger, has a smaller umbilicus, and appears to be more strongly striated. Mr. Anthony says the umbilicus of *H. striatella* is not equal to the body whorl. In the species before us, it is scarcely half equal to the body volution near the aperture.

Locality and position. Same as last.

HELIX VITRINOIDES.

Shell subglobose; spire elevated; volutions about four, convex, increasing rather rapidly, last one somewhat ventricose, contracted a little near the lip; suture distinct; umbilicus very small or closed; aperture oval or ovate; (lip reflexed?); surface unknown. Height .37 inch; breadth .44 inch; greater diameter of aperture .27 inch; smaller do. .20 inch.

Of this species we have only seen internal casts, and consequently know nothing of its surface markings. Judging from the slight contraction of the body whorl of the cast near the aperture, it is probable the lip was thickened and reflexed.

Locality and position. Same as last.

PLANORBIS TENUIVOLVIS.

Shell planorbicular; spire flat or nearly so; volutions six to six and a half, extremely narrow and closely embracing; increasing very gradually, scarcely one-third as broad as high, rounded above, prominent, or almost subangular round the outer margin, from which they round obliquely downwards and inwards towards the umbilicus, near which they are more prominent or subangular; suture well defined; umbilicus deep, acutely conical; equaling about one-third the greater diameter of the shell, and exhibiting the volutions quite to the middle of the spire; surface and aperture unknown; section of volutions extremely narrow and strongly arcuate. Greater diameter .15 inch; height .06 inch.

This remarkably delicate little shell resembles the following species (*P. amplexus*) more than any with which we are acquainted; it differs, however, in having much narrower and more closely wound volutions; about the same number being present in specimens measuring not much more than one-third the transverse diameter of that shell.

Locality and position. Same as last.

PLANORBIS AMPLEXUS.

Shell planorbicular; spire flat, or nearly so; volutions six, closely embracing, narrow, very gradually increasing, nearly twice as high as wide, rounded on the outside, subangular round the umbilicus; surface marked by lines of growth, which pass round very obliquely backwards from above to a point below the middle of the outer part of the whorls, where they are again directed slightly forwards, so as to indicate the presence of a broad, undefined sinus, below the middle of the outer lip; aperture unknown, umbilicus conical, deep, less than half the greater diameter of the shell, exhibiting the inner whorls. Greatest diameter .39 inch; height .25 inch.

This species bears some resemblance to our *P. convolutus* (Proceedings Acad. Nat. Sci. vol. 8, p. 120,) but has from one to one and a half more volutions, which 1857.]

are much narrower and more embracing. The spire also differs in being flat instead of convex, as in *P. convolutus*, and the umbilicus is much deeper, narrower and more defined in the species before us.

Locality and position. Bed C of the section of freshwater and estuary deposits at mouth of Judith River.

PLANORBIS FRAGILIS.

Shell rather large, very thin, nearly planiorbicular; (spire much depressed or flattened?); umbilicus large, deep and exhibiting all the whorls to the apex of the spire; volutions five or six, (much depressed or flat above?) prominent below, rounded on the lower outer side, subangular round the margins of the umbilicus; (periphery angular?); surface marked by rather faint lines of growth. Greatest diameter 1.23 inches; height about .40 inch.

As we have seen only imperfect specimens of this shell, we think the above description may have to be modified somewhat when better specimens are obtained. In those we have seen, the volutions appear to have been nearly flat or much depressed above, in consequence of which the outer side of the whorls is distinctly angular. This character, however, and the remarkable flatness of the spire, may be, at least to some extent, caused by pressure.

Locality and position.—Fort Berthold on the Missouri River, in Lignite Tertiary basin.

MELANIA SUBTORTUOSA.

Shell conical screw-shaped; spire not much elevated; volutions about five, very convex, distinctly angular round the middle, increasing rather rapidly from the apex; suture strongly defined, in consequence of the prominence of the angular whorls; surface and aperture unknown. Length .29 inch; breadth .21 inch; apical angle regular, divergence 47°.

The angular form of the whorls is so conspicuous a character in this species, that it will be at once known from all its associates, and indeed from all the Nebraska species we have seen, by this character alone. It bears considerable resemblance to *M. tortuosa* of Anthony, (An. Lyc. Nat. Hist., N. Y. vol. 6,) a recent species, but has a shorter spire, and not so many volutions. It is, perhaps, nearer in form to *M. acuto-carinata* of Lea, but may be distinguished by its more distinctly angular body whorl; the angle on Mr. Lea's species being only well defined on the spire.

Locality and position. Mouth Judith River, bed C. of the section of freshwater and estuary deposits at that place.

MELANIA OMITTA.

Shell small, very slender; spire elongate conical, acute at the apex; volutions about seven, flattened, or very slightly convex, increasing very gradually from the apex; suture linear, not deeply impressed; surface and aperture unknown. Length .42 inch; breadth .12; apical angle regular, divergence 23°.

Although we have seen neither the aperture nor surface markings of this little shell, we have ventured to characterize it, believing its slender form alone will serve to distinguish it from any of the other species with which it is associated.

Locality and position. Mouth Judith River, in layer of pebbly sandstone of bed G? of the fresh-water and estuary deposits at that place.

MELANIA SUBLEVUS.

Shell elongate conical; spire elevated (acute at the apex?); volutions (about seven?) very depressed convex; suture rather distinctly defined; surface apparently smooth, but when examined with a lens is seen to be marked by fine obscure lines of growth, crossed by extremely fine, nearly obsolete revolving striae; aperture ovate, angular above; columella and outer lip nearly equally

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arcuate; pillar faintly sinuous below. Length about 1.04 inch; breadth .38 inch; apical angle slightly concave, divergence 24° .

This species will be known from all the others we have seen in the Nebraska formations, by its slender spire, and slightly concave sides. It is also proportionally longer than any Nebraska species known to us, excepting our *M. convexa*, (Proceedings of the Acad. Nat. Sci. vol. 8, p. 125,) from which it may be at once distinguished by its depressed convex, instead of flat, volutions, more defined suture, finer revolving lines, and more slender spire. Unfortunately none of our specimens are quite perfect enough to show the number of volutions; one specimen consists of five turns of the spire, and, judging from the appearance of the broken apex, there were probably about two more.

Locality and position. Bad lands of Judith River, bed G. of Fresh-water and Estuary formations at that place.

MELANIA INVENUSTA.

Shell conical ovate; spire moderately elevated; volutions about seven, very slightly convex, increasing rather slowly from the apex; suture linear, not much impressed; surface marked by obscure lines of growth crossed by fine irregular rather indistinct revolving lines, a few of which, just below the suture, are larger than the others; aperture ovate; outer lip faintly sinuate above, rather prominent below the middle inner lip reflexed upon the imperforate columella, at the base of which it is broadly sinuous. Length .90 inch; breadth .37 inch; apical angle regular or a little convex, divergence 32° .

This shell is nearer our *M. Nebrascensis*, (Proceedings of Acad. Nat. Sci. vol. 8, p. 124,) than any of the Nebraska species known to us, but has about one more volution, and is uniformly more slender, the body volution being proportionally much smaller. From *M. sublevis* of this paper and any of the varieties of our *M. convexa* with which it is associated, it may be known by its much less elongate form, and more obscure surface markings. It appears to be about intermediate between our *M. convexa* and *M. Nebrascensis*, but quite distinct from both.

Locality and position. Bad Lands of Judith River, bed A. of the section of fresh-water estuary strata at that place.

MELANIA WARRENANA.

Shell small, somewhat acutely conical; spire rather elevated, pointed at the apex; volutions about seven and a half, depressed convex, closely wound and increasing gradually from the apex, last one sub-angular round the middle; suture distinct; surface apparently smooth, or only marked by very faint lines of growth; aperture broad ovate, obtusely angular above; outer lip very faintly and broadly sinuate above; columella arcuate, rather faintly sinuate below. Length .29 inch; breadth .14 inch; apical angle convex, divergence 32° .

This neat little shell is nearer our *M. Anthonyi*, (Proceed. Acad. Nat. Sci. vol. 8, p. 124,) than any other species with which we are acquainted, but is larger, and its spire more elevated. It has about one and a half to two more volutions than *M. Anthonyi*; also the body whorl is comparatively smaller, and the apical angle nine or ten degrees less. We dedicate it to Lieut. G. K. Warren, of the U. S. Top. Engs., who discovered the only specimen we have seen.

Locality and position. Summit of Square Butte, thirty miles below Fort Clark, on the Missouri, in a gray sandstone—an outlier of one of the lower strata of the Lignite Tertiary basin, where it is associated with *Corbula mactriformis*, *Melania Nebrascensis*, and *M. Conradi*?

MELANIA TENUICARINATA.

Shell ovate conical; spire turreted, not very much elevated, pointed at the apex; volutions six, convex, obliquely flattened above; suture well-defined, in consequence of the prominence of the whorls; surface ornamented by fine regular lines of growth, crossed near the middle of the volutions by from two 1857.]

to about four distinctly elevated, revolving lines, which become obsolete near the apex of the spire; the upper of these lines is larger than the others, and forms a well-marked keel, while the entire surface, above and below them, is marked by smaller, irregular, revolving lines, which, with the lines of growth, form a very fine indistinct cancellated style of ornament; aperture oval ovate, obtusely angular above; outer lip rather sharp, prominent a little below the middle, very faintly sinuous above; columella forming a gentle curve, scarcely sinuate below, not perforate. Length .54 inch; breadth .29 inch; apical angle convex, divergence variable with age, averaging about 45° .

In some of its varieties this species approaches our *M. Nebrascensis*, (Proceedings Acad. Nat. Sci. Phila., vol. 8, p. 124,) but has much more convex volutions, and greatly stronger revolving lines or keels, on the middle of the whorls.

At the time we described *M. Nebrascensis*, we had but few specimens, and those very imperfect; along with these there were one or two specimens of the species now before us, which we were then inclined to regard as only a variety of *M. Nebrascensis*. The collection now in our possession shows, however, that they are distinct, consequently it will be necessary to modify somewhat our description of *M. Nebrascensis*, so as to include only those shells with flattened or depressed convex whorls, and revolving lines, a few of which are larger than others on the middle of the volutions, but never becoming distinct angles or carinæ.

Locality and position. Fort Union, Lignite Tertiary formations.

MELANIA CONVEXA, (M. and H.)

Proceedings of Acad. Nat. Sci. Phila., Vol. 8, p. 125.

From the same locality and position as the above, we find amongst some of the late collections specimens presenting differences from that shell, which we suspect may be of specific importance; we are unwilling, however, without more individuals for comparison, to run the risk of multiplying synonyms by attempting to characterize it as a distinct species. It is a more slender shell than *M. convexa*, the lower volutions are more rounded, and the suture much more distinctly impressed, especially between the lower whorls. For the present we will designate this form as *Melania convexa*, var. *impressa*, and in case further comparisons prove it to be a distinct species, it may be designated by the latter name.

FUSUS VAUGHANI.

Shell fusiform, rather thick; volutions six to six and a half, convex, obliquely a little flattened or concave above, last one narrowing somewhat abruptly below into the (short?) canal; ornamented by small regular vertical folds, which are crossed by prominent revolving bands, less than the spaces between, so as to give the surface a coarsely cancellated aspect; of these bands about four on the body volution, and two on those of the spire are larger than the others, and form indistinct nodes, where they cross the vertical folds. Below these four larger bands on the body whorl, there are about five or six other smaller and more oblique bands, which diminish in size from above; while on the upper obliquely flattened, or concave part of the same whorls, as well as on those of the spire, there are about four much smaller revolving bands or lines. Entire surface marked by distinct lines of growth, which are crossed by fine rather obscure revolving striae, so as to produce, independent of the larger ornaments above mentioned, a fine reticulated style of marking. Aperture narrow ovate or oval; outer lip bevelled; inner lip thin, folded upon the arcuate and tortuous columella. Length about 1.43 inches; breadth .75 inch; apical angle convex, divergence about 54° .

This species is quite unlike any of those we have hitherto seen from the Nebraska formations. Although apparently occurring in the same bed with well marked Cretaceous forms, it is, like many of the upper Cretaceous species already described by us from this region, very nearly allied to forms belonging to the

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Tertiary system of the old world. One of these, *F. variusculatus* of Deshayes, (Coq. Fos. p. 556, pl. 76, figs. 32, 34,) resembles it very closely in form and surface characters, but differs in having the outer lip distinctly crenulated within.

The specific name is given in honor of Col. A. J. Vaughan, Indian Agent for the Upper Missouri country, to whose patronage we are indebted for many of the Nebraska species heretofore described by us.

Locality and position. Near mouth of Heart River, junction of Upper Cretaceous and Tertiary beds.

FUSUS SUBTURRITUS.

Shell fusiform; spire conical, turreted, very acute at the apex; volutions about seven and a half, obliquely flattened or a little concave above, convex, and ornamented round the middle by a single row of rather prominent nodes, which on the upper whorls are prolonged so as to form more or less distinct vertical folds, last one tapering rather obliquely into the straight canal; surface ornamented by fine lines of growth, which are crossed by small rather regular elevated thread-like lines, about equalling the spaces between; suture linear, and when viewed from above is seen to deviate from a regular curve in following the undulating outline of the prolonged nodes: aperture obovate, narrowing below into the canal. Length about 1.73 inches; breadth .90 inch; apical angle nearly regular, divergence 55°.

This species is more nearly related to our *F. Newberryi* (Proceed. Acad. Nat. Sc. Philada. vol. 8, p. 66) than any shell we have seen, but differs in having a more elevated spire, which is much more acute at the apex; it also has from two to two and a half more volutions than *F. Newberryi*, and much more prominent nodes.

Locality and position. Upper part of No. 4, near Grand River.

FUSUS INTERTEXTUS.

Shell fusiform, or elongate rhomboidal, rather thick; spire conical, moderately elevated; volutions about six, convex below, sloping very obliquely, and concave above, ornamented round the middle by a regular row of vertically elongated nodes; last whorl tapering rather gradually into the canal; suture not very distinct; surface ornamented by well marked lines of growth, which are crossed by strong, elevated, revolving lines, less than the spaces between on the middle and upper portions of the whorls, but smaller, more crowded, and sometimes alternating in size, below the middle of the last turn; aperture narrow obovate, obtusely angular above, narrowing gradually below; margin of outer lip sharp or bevelled, prominent in the middle, retreating above and below; inner lip scarcely distinct from the slightly arcuate columella. Length about 1.87 inches; breadth .86 inch; apical angle convex, divergence 50°.

In many respects this species approaches our *F. Newberryi* (Proceed. Acad. Nat. Sc. Philada. vol. 8, p. 66,) but differs in the greater elevation of its spire, more elongated form, and stronger, as well as more distant revolving lines. It also has about one more volution, and the apical angle measures 5° less.

Like *Fusus Newberryi*, in the prominence of the middle of the outer lip, and consequent subsinuate character of its upper part, this shell approaches some varieties of *Pleurotoma*, but appears to be a true *Fusus*.

Locality and position. Yellow Stone River, 150 miles above its mouth, in a bed apparently a blending of No. 4 and 5 of our section.

FUSUS (PLEUROTOMA ?) SCARBOROUGHII.

Shell fusiform; spire conical, acute at the apex; volutions about six and a half, flattened, or slightly concave above; last one contracting abruptly below into a small (rather short?) canal; suture small, not deeply impressed; surface ornamented by fine regular lines of growth, crossed by numerous distinct, rather closely arranged, elevated, thread-like lines, which are slightly variable in size, but generally equalling the spaces between; sometimes more closely crowded and smaller just below the suture, than on the middle of the whorls; aperture narrow ovate, angular above, tapering into the canal below; outer lip thin, 1857.]

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inent near the middle, and having a broad faint sinus above; columella arcuate. Length about 1.42 inches; breadth .67 inch; apical angle convex, divergence 40°.

Not having seen a specimen of this species showing very clearly the form of outer lip, we are left in some doubt as to whether it is not more nearly related to *Pleurotoma* than *Fusus*. The lines of growth, are so deflected below suture, as to indicate the presence of a broad faint sinus in the upper edge of the lip, as in *Pleurotoma*; the general aspect of the shell, however, is more like *Fusus* than *Pleurotoma*. It is probably one of those connecting links between those genera, often met with amongst fossil species. None of our specimens show the entire length of the canal, but we are inclined to think it was not very long.

There is no other shell in the Nebraska formation No. 5 known to us, resembling this in other respects, that has so remarkably convex a spiral angle, the convergence from the first to the second volution being only about 30°, while the angle at the apex is as much as 48°.

We have named this species in honor of Mr. George Scarborough, of Owensboro', Ky., a quiet but devoted cultivator of natural science.

Locality and position. Butte aux Gres, on the Missouri River, formation No. 5 of the section.

New Gen. PSEUDOBUCCINUM.

Owing to the fact that the limits of the great genus *Buccinum* are badly defined, and several attempts have already been made to erect into distinct genera, forms regarded by many of the ablest conchologists as merely sections of that genus, it is with hesitation we venture to propose for a shell of this type a new generic name. Although evidently related to *Buccinum*, the species before us presents, we think, an ensemble of characters of sufficient importance to be regarded as the type of a distinct group. In the first place, it differs remarkably from the species of that genus known to us, in the deeply arcuate and strongly tortuous character of its columella, as well as in the comparatively large size of the body volution and aperture. So distinctly marked are these characters, that it appears probable, if the matrix were removed from the inside of the shell, the whole interior, quite to the apex of the spire, would be visible from below. It likewise differs from any of the species of *Buccinum* coming under our observation, in being a much thinner shell, and in having, instead of a short reflexed canal or deep notch at the base of the columella, simply a small rounded sinus.

In form and general appearance it resembles *Sulcobuccinum* of D'Orbigny, and *Pseudoliva*, of Swainson; but differs from them both in its strongly arcuate and tortuous columella, as well as in wanting the revolving sulcus on the exterior of the body whorl. It is also a much thinner shell than we have seen amongst the species of either of these types, and wants the small notch in the outer lip, characteristic of the first, and the projecting spine on the inner side of the same in the other.

As it is not possible to give definitely the characters of a genus, of which but a single species is known, we will for the present merely repeat a description given on a former occasion of this shell, without attempting to separate the specific characters from those that may be only of specific importance.

PSEUDOBUCCINUM NEBRASCENSIS.

Buccinum ? Nebrascensis, M. & H., Proceed. Acad. Nat. Sci. Vol. 8, p. 67.

Shell oval, thin; spire very short; volutions three to three and a half, convex, rapidly increasing from the apex, last one very large and somewhat ventricose; surface marked with distinct lines of growth, which are crossed by flattened revolving bands, much wider on the upper part of the volutions than the shallow grooves between, but about equalling them on the lower part of the last turn. About seven or eight of these bands may be counted on the second volution; suture narrow and slightly channeled; aperture large, subelliptical.

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angular above, and terminating in a rather small, rounded sinus below, the form of which is well defined by a sudden curve in the lines of growth on a broad spiral ridge round the edge of the pillar lip; outer lip very thin; inner lip thinly spread over the extremely tortuous columella. Length .77 inch; breadth .58 inch; length of aperture .61 inch, breadth of do. .36 inch; apical angle convex, divergence 105°.

Locality and position. Moreau Trading Post and Fox Hills, No. 5 of the series.

XYLOPHAGA ELEGANTULA.

Shell small, globose-cordate, very ventricose; posterior rounded and closed; anterior having a profound angular notch in the under part, so as to produce a very large hiatus extending more than one-third the length of the shell back from the buccal extremity, and above the middle; beaks elevated, gibbous, very strongly incurved and placed a little in advance of the middle; surface ornamented by small regular concentric wrinkles and very fine lines of growth; the wrinkles are rather obscure on the posterior part of the shell, but upon reaching a narrow sulcus, which passes from the beaks to the base, a little in advance of the middle of the shell, they suddenly become more distinct, and are deflected upwards nearly parallel with the vertical margins of the hiatus, near which they again become very fine and regular; on passing upon that portion of the valves extending out in front over the hiatus, these fine wrinkles are deflected, almost in a horizontal direction, and suddenly enlarged, but rapidly diminish, and converge as they pass round the anterior extremity.

On the cast, the mesial sulcus extending from the beaks to the base is very narrow but deep and sharply defined. At the points where the concentric wrinkles cross this sulcus or groove, it is distinctly punctate. Further back, a rather distinct carina extends from the back part of the beaks obliquely backwards and downwards nearly to the base of the shell; immediately behind this ridge, the posterior part of the cast is suddenly compressed, and faintly marked by a large leaf-like muscular impression. The pallial impression is narrow, stands nearly vertical, and extends more than half way up to the beaks between the mesial sulcus and posterior carina.

Locality and position. Muscle shell River, where it was found embedded in fossil-wood,—formation No. 4.

XYLOPHAGA STIMPSONI.

Shell ovate, gibbous in front, and cuneate behind; posterior end obliquely subtruncate above, round below, nearly or quite closed; anterior having a distinct angular notch below, which forms a large hiatus extending back one-fourth the length of the shell and upwards above the middle; base and dorsal margins parallel; beaks not much elevated above the dorsal edge, pointed at the apex, and strongly incurved. Surface marked by distinct, regular concentric wrinkles, and extremely fine lines of growth. The wrinkles are more obscure on the posterior part of the shell, but on crossing a narrow sulcus (in the cast) that passes from the beaks to the base, they become more distinct, and curve gracefully upwards nearly parallel with the edge of the hiatus; on passing forward upon the upper anterior part of the valves extending out over the hiatus, they are suddenly deflected in a horizontal direction and become stronger, but rapidly diminish and converge in passing round the anterior extremity.

On the cast, the mesial groove extending from the apex of the beaks obliquely downwards and a little backwards to the base, is narrow but well defined. A little in advance of this, and nearly parallel with it, a fainter impressed line passes from the beaks to the base. About half way between the mesial groove and the posterior end of the shell, another deep, but broader, groove extends from the posterior side of the beaks obliquely backwards nearly to the lower part of the anal extremity; behind this the narrow oval posterior muscular impression is seen faintly indicated near the border.

Although resembling the last in its style of ornament, this is a very distinct 1857.]

species, being ovate in form instead of globose-cordate. It also differs in having greatly less elevated beaks.

We dedicate the species to Mr. W. Stimpson, Naturalist of the South Pacific Exploring Expedition, to whom we are under obligations for suggestions respecting this and the preceding species.

Locality and position. Same as last.

PHOLADOMYA SUBVENTRICOSA.

Shell longitudinally oval, ventricose in the umbonial and buccal regions, more compressed behind; extremities rounded; base forming an elliptic curve; dorsum concave behind the beaks, declining very abruptly in front; beaks elevated, gibbous, located near the anterior end, distinctly incurved; surface ornamented by about thirty very small, rather flexuous, radiating costæ, some of which die out before reaching the beaks, crossed by faint concentric wrinkles, and fine rather indistinct lines of growth, which produce on the costæ very small irregular nodes or granules; costæ most distant near the extremities of the shell, and wanting on an oval or cordate space at the anterior end. Length about 2 inches; height 1.10 inch; breadth 1.10 inch.

This shell resembles very nearly a Lower Green sand species described by Prof. Forbes in the Journ. Geol. Soc. Lond. vol. i. p. 238, pl. 2, fig. 3, under the name of *P. Martini*; but the beaks are more elevated, and nearer terminal in our shell, and the costæ more numerous. The concentric wrinkles likewise differ in being not quite so distinct as on *P. Martini*.

It is yet more closely allied to a species described by one of the writers* in Trans. Albany Institute, vol. 4, p. 42, from Vancouver's Island, under the name of *P. subelongata*; but has more elevated beaks, and finer, as well as more numerous costæ; the buccal end is also more gibbous than in *P. subelongata*.

Locality and position. Mouth of Judith River, formation No. 1? of general section.

SOLENA? DAKOTENSIS.

Shell long and slender, rather compressed; dorsal margin and base parallel; posterior end narrowly rounded, (anterior end?); beaks not distinct from the dorsal edge, located near the centre of the shell; surface of cast marked by very obscure traces of concentric wrinkles, indicating the direction of lines of growth. Length 1.40 inch; height .35 inch; breadth about .20 inch.

This species resembles *S. æqualis*, D'Orbigny, (Pal. Franc. tom. 3d, pl. 350, figs. 5, 6,) more than any shell with which we are acquainted; but is proportionally narrower, and the beaks are less distinct from the cardinal border. The only specimen we have seen is a cast of the outside of both valves, lying partly open and embedded in the matrix. Although we know nothing of the surface markings or interior of this shell, we have ventured to characterize it, believing it important to call attention to the few forms found in the formation in which it occurs, however obscure they may be, as there remains some doubt in regard to the exact age of this deposit.

Locality and position. Just below the mouth of Vermilion River on the Missouri, formation No. 1 of general section.

New Gen. CORBULAMELLA.

The small shell upon which we propose to establish the above genus appears to be related both to *Cardilia* of Deshayes, and *Corbula* of Bruguiere. It differs from the first, however, in being distinctly inequivalve, and in wanting the spoon-shaped projection for the reception of the ligament, mentioned by Deshayes. From *Corbula* it differs in having the posterior muscular attachment raised upon a thin, strongly projecting plate, as in *Cucullæa*. The teeth of the hinge, and pallial impression appear to be as in *Corbula*. We have not been able to determine whether the ligament was internal or external.

* Mr. Meek.

As this shell appears to agree in so many characters with *Corbula*, the propriety of separating it from that genus may be doubted by some; it presents, however, such a marked difference from any species of *Corbula* we have seen, in the peculiar very strongly projecting internal plate above referred to, that we are satisfied there must have been some corresponding difference in the organization of the animal.

As we have hitherto met with but the one species, it is of course impossible to determine, in every instance, which of its characters are of specific, and which of generic importance, consequently we will not attempt to give a formal diagnosis of the genus, but will merely repeat, with slight modifications, the description given by us some little time back in the Proceedings of the Academy.

CORBULAMELLA GREGAREA.

Corbula? gregarea, M. & H., *Proceed. Acad. Nat. Sci.* Vol. viii, p. 84.

Shell very small, inequivalve, approaching subglobose, a triangular form, right valve more ventricose than the other; beaks nearly central, gibbous, that of the right valve elevated above the left, incurved; surface polished and marked with a few faint irregular concentric wrinkles of growth; hinge having under the beak a single prominent tooth in each valve; anterior muscular attachment rather indistinct, posterior raised upon a strongly projecting lamina; pallial impression scarcely sinuous. Length .13 inch; height .13 inch; breadth .10 inch.

Locality and position. Occurs in great numbers on Yellow Stone River in a bed apparently a blending of No. 4 and 5.

CYPRINA ARENAREA.

Cast of interior very broad ovate, subtrigonal, moderately compressed, most convex in the umbonal region; extremities rounded, the posterior sometimes slightly truncate; base semi-ovate or broadly rounded; dorsal margin sloping rather abruptly, with a regular convex curve from the beaks to the posterior end, concave and much more abruptly declining in front; beaks rather elevated, lightly gibbous, located a little in advance of the middle of the shell. Length .95 inch; height .80 inch; breadth .53 inch.

This species has much the form and general appearance of a *Cytherea*, but as here is no indication of a sinus in the pallial impression, on any of the casts we have seen, and the teeth of the hinge, as near as can be ascertained from internal cast, are like those of *Cyprina*, we place it provisionally in that genus.

Locality and position. Big Sioux River, two miles above the mouth, in sandstone of formation No. 1, where it is associated with fragments of fossil wood bored by *Teredo*.

CYPRINA CORDATA.

Shell thick, cordate, gibbous; extremities and base rounded; umbonal region entricose; beaks much elevated, nearly central, distinctly curved obliquely upwards and forwards; muscular impressions not very deep, surface marked by strong concentric lines, and small wrinkles of growth, crossed by faint traces of radiating lines. Length 1.66 inches; height 1.68 inches; breadth about 1.49 inches.

As we have not yet seen the hinge of this shell, we are in some doubt in regard to its affinities; and only place it provisionally in the genus *Cyprina*. The character of the muscular impressions, with its simple pallial line, and general appearances, are such as to indicate its relations to that genus. It will be at once distinguished from all the other forms we have yet seen from the Nebraska rocks, by its high curved beaks, gibbous cordate form, and distinct lines of growth; the radiating lines mentioned above are so very faint as to be readily overlooked, excepting when the shell is viewed in a certain light, and may be often absent.

Locality and position. Moreau River, No. 5 of the series.
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CYPRINA COMPRESSA.

Shell broad ovate, rather thin and compressed, somewhat narrowly rounded at the extremities, base semi-oval; beaks elevated, approximate, not strongly curved, located about three-eighths the length of the shell back of the anterior end; cardinal border declining rather abruptly, with a greatly convex outline, from the beaks towards the posterior end, concave and more abrupt before the beaks; surface unknown; muscular impressions rather distinct. Length 2.66 inches; height 2.17 inches; breadth about 1.15.

We are not sure we have seen specimens of this species showing the surface characters; some fragments in the collection from the same locality and position apparently of the same shell, are simply marked with rather strong lines of growth. It is barely possible this may be a variety of the last; the beaks, however, are so much more elevated, and farther removed from the anterior end, that we are at present inclined to regard it as a distinct species.

Locality and position. Same as last.

CYPRINA SUBTUMIDA.

Shell rather small, ovate, moderately gibbous; anterior end narrowly rounded below the beaks; posterior subtruncate at the extremity; base forming a gently convex curve, contracted towards the posterior; cardinal border declining with a long gentle curve from the beaks to the posterior end, concave and very abrupt in front; beaks located near the anterior end, directed obliquely forward, not much elevated; umbonial region gibbous; valves prominent or almost subangular from near the beaks obliquely backwards towards the lower part of the posterior end; muscular impressions not deep, anterior ones smaller and more distinct than the others; surface unknown. Length (of cast) .92 inch; height .65 inch; breadth .55 inch.

This species is not very nearly related to any we have seen figured in foreign works, and may be known from any of those we have described from the North West, excepting *C. cordata*, by its more gibbous form, more ventricose and oblique umbonial slopes, as well as less elevated beaks. From *C. cordata* it will be at once distinguished by its ovate form and greatly less elevated beaks.

Our specimens do not show very satisfactorily the surface markings, as the exterior has been mainly removed by the exfoliation of the shell. There are, however, indications of lines of growth, and on the surfaces of the laminae faint traces of radiating marks; though the latter may have had no connection with surface markings. Not enough of the shell remains to show the character of the points of the beaks.

Locality and position. Yellow Stone River, in beds apparently a blending of No. 4 and 5.

CYPRINA OVATA.

Shell ovate, compressed, rather thin, somewhat narrowly rounded at the extremities; base semi-ovate; cardinal border declining with a gentle curve from the beaks towards the posterior extremity, concave and sloping more abruptly in front; beaks not much elevated, rather small, approximate, not strongly curved, located a little more than one-fourth the length of the shell behind the anterior border; surface ornamented by distinct concentric lines of growth; lunule small, and not distinctly defined; corselet lanceolate, profound; hinge moderately thick, lateral teeth long; cardinal teeth not very prominent; muscular and pallial impressions distinct, but not deep. Length 2.55 inches; height 2.05 inches; breadth 1.15 inches.

This species resembles *C. oblonga*, D'Orbigny, (Pal. Franc. tom. 3d, p. 105, pl. 277, fig. 1-4.) but is more narrowly rounded at the extremities, and the lateral tooth of the right valve is not near so prominent.

Locality and position. Mouth Heart River, at junction of formation No. 5 of the general section with the base of the Tertiary, but probably in the former.

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UNIO DANAI.

Shell elongate, arcuate, and oblique, contracting posteriorly; anterior end regularly rounded; base slightly arched, most contracted a little behind the middle; posterior end cuneate, rather narrowly rounded; dorsal margin sloping with a long convex curve from near the umbones towards the posterior end; beaks depressed, not very distinct from the dorsal edge, placed a little more than one-fourth the length of the shell from the anterior end; flanks concave from the umbonial region obliquely downwards to the most arcuate portion of the base; hinge moderately thick; cardinal teeth corrugated, strong, apparently double in the left valve, and single in the right; lateral teeth long and slender; surface (of specimens with the epidermis removed) marked by faint lines of growth, and very obscure radiating striæ. Length 3.50 inches; height 1.54 inches; breadth about 1 inch.

After satisfying ourselves that this and the two following species are distinct from all the fossil *Uniones* described in any works within our reach, we submitted them to Mr. Isaac Lea, the well-known conchologist of Philadelphia, from whom we received the following remarks respecting their affinities to recent species.

"The specimen marked *Unio Danai* has very much the same outline with *Margaritina margaritifera*, Schm., but is a true *Unio*, and perhaps more nearly allied to *U. tumidus*, Retzius, than to any other of the genus. It is certainly an undescribed species.

"*Unio Deweyanus* is a very distinct species, and although not more than half the size, very closely resembles the recent *U. truncatus*, Swainson, in outline and obliqueness. It is also, like it, a thick ponderous species.

"*Unio subspatulatus* is an oblique species, nearly allied to *U. spatulatus*, Lea, but is more rounded posteriorly than that shell.

"All these species are characterized by an obliqueness not usual in the genus. The beaks are nearly terminal in all of them, and they have a general massive character, which causes a disposition to enlarged cardinal and lateral teeth. This enlargement is more particularly noticeable in the cardinal teeth, which are all massive and very much corrugated. It is evident from the deep corrugations of the great cicatrices, that the muscular power of the animal was very great.

"They are certainly very interesting specimens, and deserve attention, as they differ much from the general type of recent *Uniones*, as well as those of the Wealden of England."

Owing to the fact that these shells were obtained from a formation in which saurian remains, similar to some of those of the Wealden were found, we called Mr. Lea's attention to that fact, with the view of also obtaining his opinion respecting their affinities to Wealden forms. From his remarks above, it will be seen he is of the opinion they are distinct from the types of that epoch. Mr. Lea's opinion on this point is of much value, since he had an opportunity, while in England some years since, of studying very carefully Dr. Mantell's extensive collection of Wealden species.

We name this shell in honor of Prof. James D. Dana, the distinguished naturalist of New Haven, Connecticut.

Locality and position. Mouth of Judith River, bed G. of the freshwater and estuary deposits at that locality.

UNIO DEWEYANUS.

Shell rather thick, oblique, narrow-ovate, approaching a narrow-elliptic form, most convex in the umbonial region, more compressed and cuneate posteriorly; extremities rounded, anterior end a little wider than the other; base broad, semi-ovate; dorsal margin nearly straight, and sloping gradually from near the beaks towards the posterior end; beaks small, not very distinct from the dorsal border, almost terminal in old shells, but in young individuals a

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little more removed from the buccal margin; surface (of specimens with the epidermis wanting) showing obscure lines of growth, crossed by very fine indistinct irregular radiating striæ; ligament long; hinge much thickened at the anterior end of the valves, composed of two rough irregular cardinal teeth in the left valve, and one more prominent tooth in the right; lateral teeth long and slightly arched; dorsal cicatrix located nearly under the beaks, not very deep; anterior cicatrix distinct, and strongly corrugated; cavity of the beaks shallow. Length about 2.60 inches; height 1.33 inches; breadth about 1.18 inches.

Named in honor of Rev. Chester Dewey, of Rochester University.

Locality and position. Bed G. of the freshwater and estuary formations at the mouth of Judith River. (See section at that place.)

UNIO SUBSPATULATA.

Shell moderately thick, oblique, elongate-ovate, rather compressed, most convex at the anterior end, cuneate behind; buccal end wider than the other, abruptly rounded or subtruncate; posterior end narrowly rounded; base nearly straight or very slightly concave; dorsal margin sloping a little, with a long, convex curve from near the umbones, towards the posterior end; beaks small, not much elevated, located at the anterior end; surface (epidermis gone) showing faint lines of growth, crossed by fine irregular, radiating striæ; hinge and interior unknown. Length 2.83 inches; height 1.34 inches; breadth .75 inch.

This species is related to *U. Danai* of this paper, but is more compressed, and its base and flanks are less contracted. It likewise presents the well marked difference of having terminal beaks, while those of *U. Danai* are removed about one-fourth the length of the shell back from the anterior end.

From *U. Deweyanus* of this paper, to which it is also related, it differs in being more elongated and compressed. It is also more arched on the back and more contracted along the lower border.

Locality and position. Same as last.

PECTUNCULUS SUBIMBRICATUS.

Shell transversely oval, nearly circular, not much compressed, equilateral; extremities rounded, posterior end sometimes slightly broader than the other; base rather more broadly rounded; cardinal border slightly arched, moderately thick; beaks (obtuse?) not much elevated or incurved; surface ornamented by about fifty simple, rounded, depressed radiating plications, a little more than twice as broad as the grooves between, crossed by numerous regular, distinct, imbricating lines of growth, which arch upwards in crossing the costæ; cardinal teeth about twenty-five, not large, lateral ones arcuate, with the concave sides turned from the beaks; ligament area moderate, marked by about six grooves, which form very obtuse angles under the beaks; muscular impressions large but not deep. Length 1.49 inches; height 1.36 inches; breadth 1.02 inches.

Associated with the above we have a single valve of another individual not more than one-sixth as large, and having comparatively a smaller ligament area, fewer teeth and rather less prominent beaks. The costæ are also apparently obsolete over proportionably larger spaces at the extremities of the hinge. This we suspect may be a distinct species, but without more specimens for comparison we are unwilling to so regard it at present. If it should prove to be a different species we would suggest for it the name of *P. suborbiculatus*.

Locality and position. Heart River, near junction of No. 5 with the Tertiary, but perhaps in the former.

OSTREA GLABRA.

Shell elongate-ovate, rather irregular, usually curving to the left, but sometimes to the right; generally narrower near the beaks than at the other ex-

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tremity. Lower valve rather deep; ligament area small and well defined; beaks somewhat pointed at the extremity, most frequently turned abruptly to the left; umbonal region sometimes a little distorted by the cicatrix of attachment. Upper valve flat, or a little concave; beak truncated at the extremity. Surface smooth, or only marked by very small, faint concentric wrinkles of growth. Length about 3 inches; breadth 1.50 to 2 inches.

Locality and position. Mouth of Judith River, in sandstone of formation No. 1? of general section.

OSTREA TRANSLUCIDA.

Shell small, thin and translucent, arcuate, attached by the under side of the lower valve in the umbonal region; border having faint indications of three or four broad undefined plications; beaks small, more or less distinctly curved to the left; lower valve convex, rather deep; ligament area very small and triangular, sometimes linear and abruptly curved to the left; margins on each side of the beak regularly and rather distinctly crenulated; muscular impression ovate, small, very near the left border, indistinct; upper valve nearly flat, or slightly concave near the middle, sometimes distinctly alate on the left side at the beak, regularly and closely rounded on the other side; cardinal end transversely truncate; beak not extending beyond the truncated cardinal edge, but curving round to the left within the margin; surface nearly smooth, or marked only by faint subimbricating lines of growth. Length about 1 inch; breadth .53 inch; depth of lower valve .30 inch.

This species resembles *O. larva* of Lamarck, and is the shell referred by us with doubt to that species in the catalogue of Nebraska Cretaceous and Tertiary fossils given in our last paper. A comparison of better specimens in the late collections, with authentic specimens of *O. larva* proves them to be quite distinct. Our shell never being near so distinctly plicated round the border as that species, nor is it auriculate on both sides of the beak as in *O. larva*. Its mode of attachment is likewise altogether different, being more like *O. crenulata* of Tuomey, in that respect; it also sometimes resembles the latter shell in the crenulate character of its borders on each side of the beaks, but differs in wanting the closely plaited squamose ridges mentioned by Prof. Tuomey.

Locality and position. Long Lake on the Missouri, in the upper part of No. 5 of the section.

HEMIASTER? HUMPHREYSANUS.

Shell broad cordate or subcircular, rather depressed, greatest elevation near the posterior, declining very slightly towards the front; broadest a little in advance of the middle, rather flat below; oral aperture, not large, transversely oval, arcuate, with convex side towards the front, located about one-fourth the length of the shell from the anterior end; vent small and of an oval form; apical disc not more than one-third the length of the shell in advance of the posterior end; genital pores four, rather large; dorsal ambulacra, excepting the odd one, distinctly petaloid, very unequal; anterior or odd one long, lanceolate, and extending nearly to the margin, located in a deep rounded groove which passes over the front to the mouth, giving an emarginate character to the anterior end, having about thirty-three pairs of pores in each series; anterior lateral ambulacra flexures a little broader than, and not quite so long as, the odd one, placed in distinct grooves, and having about thirty-five or six pairs of pores in each series; posterior ambulacra very small, not much more than one-third as long as the anterior laterals, oval in form, and having about eighteen pairs of pores in each series, not deeply excavated; inter-ambulacral spaces prominent, anterior two rather pinched up; surface unknown. Length 1.21 inch; height .81 inch; breadth 1.20 inch.

Not having seen specimens showing the surface markings of this species, it is with some doubt we refer it to the genus *Hemiaster*, the absence of the shell 1857.]

leaving some doubts in regard to the presence of the fasciale characteristics of that genus. The posterior position of the apical disc, and the close proximity of mouth to the front, as well as the great inequality of the posterior and anterior lateral ambulacra, appear to remove it from the genus *Toxaster*. In some respects it resembles the genus *Schizaster*, but does not decline so distinctly towards the front above, as is common amongst the species of that genus. It may belong to a new type.

It is remarkable, that in all the collections hitherto obtained from the Cretaceous rocks of Nebraska, this is the only species of *Echinoderm* yet met with, and it is so rare that but the single specimen now before us, and a fragment mentioned in one of our former papers, from the same locality, have been met with.

We take pleasure in naming this rare and beautiful fossil in honor of Capt. A. A. Humphreys, of the U. S. Topographical Engineers.

Locality and position. Yellow Stone River, in a bed composed of a blending of No. 4 and 5 of the general section.

On the LARVA of the *Thyreus Abbottii*.

BY J. P. KIETLAND, M. D.

Swainson, in his Zoological Illustrations, vol. i. First Series, described the *Thyreus Abbottii*, which, together with the Pupa and Larva, he figured on the authority of Mr. Abbott's unpublished drawings.

Dr. Harris' Catalogue of North American Sphinges, in the Amer. Jour. of Sciences and Arts, vol. xxxvi., contains also a description of this larva, drawn from Swainson's sketch. With due deference to these high authorities, I beg leave to state, that neither their figures nor descriptions bears the least resemblance to the true larva.

During the last three years I have reared many of them and carried them through the second stages of transformation to the perfect insect.

At maturity the Larva is about the length of Swainson's figure, but its diameter is one-fifth less. Its upper surface is ash color, with its belly and legs tinged with a faint violet. It is not furnished with a caudal horn as represented in Swainson's figure, but in place of it has an oval eyelet or occuli, of a glossy brown color, and a line or two in diameter. This Larva resembles more the common silk worm (*Bombyx mori*) than it does Swainson's figure. Its principal food is the leaf of the *Ampelopsis quinquefolia*, though it occasionally is found on the cultivated grape vine.

During the month of August it attains its full size, and individuals may be seen at night descending to the ground, where it enters the pupæ state, below the reach of frost.

Specimens kept in boxes of earth beneath the shelves of a warm green house, appeared in the perfect state as early as the first of April, while those preserved in a cool cellar did not assume that form till late in May, or early in June.

That Dr. Harris was led into an error by Swainson's figure I have no doubt, for Dr. H. sent me a drawing and colored figure of this *true* Larva four years since, requesting of me information as to the perfect insect it produced. To prevent a further extension of that error is the object of this communication.

[May,

June 2d, 1857.

Mr. ORD, President, in the Chair.

The following papers were presented for publication in the Proceedings, viz :

Notes on the Geology of the Mauvaises Terres of White River, Nebraska, by F. V. Hayden, M. D.

Prodromus descriptionis animalium evertibratorum, quæ in Expeditioni ad Oceanum Pacificum Septentrionalem a Republica Federatâ missâ, Cadwaladaro Ringgold et Johanne Rodgers ducibus, observavit et descripsit W. Stimpson.

Description of two new genera of Shells, and Rectification of some of the generic names of American Tertiary Fossils, by T. A. Conrad.

Which as usual were referred to committees.

Dr. Leidy remarked that upon one of the specimens of coal shales with fossil fishes, from Linton, Jefferson Co., Ohio, presented this evening by Mr. Wheatley, there was a compressed oval, black, shining, brittle, homogeneous mass, about three inches long, and one inch and a quarter wide, by two lines in thickness, which he suspected to be the ink bag of a Loligo, or cuttle-fish. The carbonaceous mass can readily be reduced to an impalpable powder, which has the same appearance and color as that derived from the fossil Loligo of the Lias of Würtemberg.

Mr. Lea exhibited two specimens from the dark slates of the Red Sandstone of Phoenixville, Pa., which had been procured by Mr. Wheatley from the tunnel of the Reading Railroad. These specimens contained a *bone* and a *coprolite*, and through the mass could be observed imperfect portions of the so-called *Posidonia*, which has been found usually wherever these black slates occur. The bone is fractured at both ends, is nearly four inches long and three-quarters by nearly half an inch thick. It is flattened on the outside and curved on the inner side. The transverse section nearly resembles that which, as the fore-arm or leg, Mr. Lea figured in the Journal, N. S., vol. ii., pl. 18, fig. 1, under the name of *Clepsysaurus Pennsylvanicus*, and it may be identical with that species; or it may belong to that of *Centeodon sulcatus*, Lea, which was described in the Proceedings of the Academy in April of last year, from a single tooth, and which he found within a few hundred yards of the same locality, at the northern end of the same tunnel. This is another evidence among the very few in Pennsylvania of the existence of Saurian life at the period of this interesting Red Sandstone formation. The specimen of coprolite is more perfect than any Mr. Lea had seen from the same locality, and was probably one of the ejectamenta of this Saurian.

June 9th, 1857.

Dr. B. COATES in the Chair.

Dr. Leidy remarked that the specimens of coprolites and shales with *Posidonia*, and the left dental bone of a fish presented by Mr. Conrad and himself this evening, had been obtained in a recent visit to Black Tunnel, near Phoenix-1857.]

ville, Chester Co. The *Posidonia* Mr. Conrad regards as identical with the *P. multcostata* and *P. triangularis* of Prof. Emmons, obtained from a corresponding geological formation of Chatham Co., N. C.* The former species had been previously indicated by Mr. Lea under the name of *P. ovata*† from specimens obtained at Phoenixville, and probably the latter was also indicated under the name of *P. parva* from smaller specimens than those presented this evening, but likewise obtained from the same locality.

The dental bone referred to, apparently belongs to a ganoid fish, probably allied to *Eugnathus* or *Belonostomus*.

Dr. L. further observed that Prof. Emmons had recently discovered the remains of an insectivorous mammal in the same series of rocks of Chatham Co., N. C.‡ The animal, *Dromatherium sylvestre*, is closely allied to the *Spalacotherium*, Owen, from the English Purbeck beds of the oolitic series, and it may probably indicate that the rocks in which it was found, with those corresponding in this State, may be of the same age as those of the Richmond coal field.

The *Clepsysaurus*, Lea, of the same rocks of Pennsylvania and North Carolina, is not properly a thecodont reptile, but may form the type of a new family, as its teeth are inserted in the jaw by solid conical fangs. *Omosaurus* of the same formations is probably a distinct genus from *Clepsysaurus*.

Mr. Cassin announced the death of Lieut. J. C. Strain, late a Correspondent of the Academy.

June 16th, 1857.

Dr. T. B. WILSON in the Chair.

The following papers were offered for publication, viz :

Notices of the Remains of extinct Fishes, by J. Leidy, M. D.

Description of a new species of *Myacites*, by T. A. Conrad.

Description of a new genus of the family Dreissenidæ, by T. A. Conrad.

Examination of Enargite, from New Grenada, by W. J. Taylor.

Which were referred to Committees.

Dr. Leidy read a letter from Dr. J. S. Newberry, dated Washington, D. C., May 4, 1857, desiring that the title *Mekolepis*, applied by him to a genus of fossil fish, be changed to *Eurylepis*, the former having been anticipated by Duméril and Bibron. The species would then read *Eurylepis corrugatus*; *E. tuberculatus*; *E. granulatus*; *E. lineatus*; *E. ovoideus*; *E. ornatissimus*; *E. insculptus*; *E. serratus*.

Dr. Leidy exhibited specimens of New Red Sandstone fossils from near the Gwyned tunnel, on the North Pennsylvania Railroad, collected by Mr. Lea and himself. These are species of *Cypris*, very numerous, some scales of Ganoid fishes, and remains of bones and teeth, probably Batrachian.

Dr. Morris called the attention of the Academy to some fishes kept in a vase where water was not removed frequently enough; the fishes then rise at short intervals to the surface and swallow air, thus maintaining their respiration; showing that the exchange of gases in this class of animals takes place readily as long as the branchiæ are kept moist, and illustrating the mode of respiration in the genus *Anabas*.

* Geol. Rep. of North Carolina, 1856, p. 337.

† Proc. A. N. S. viii. 78. April, 1856.

‡ American Geology, pt. vi. p. 93.

[June,

Mr. Vaux announced the decease of Mr. Thos. Biddle, late a member of this Academy.

On motion of Mr. Cassin, the thanks of the Academy were presented to Mr. J. H. Slack for his valuable donations to the Ethnological collection received this evening.

June 23d, 1857.

Mr. ORD, President, in the Chair.

Mr. Vaux read a letter from Mr. John Biddle, dated June 11th, 1857, accompanying the crania of Thugs presented this evening.

My late brother-in-law Wm. A. Foster, in 1836 (at which time we were both residing in Calcutta) applied to Dr. Martin, E. I. Co.'s Surgeon, and the leading physician of that city, to procure for him the skulls of some Thugs. Dr. M. did not succeed in obtaining them until the latter part of 1837, at which time Mr. F. had left India for the United States. As I was still there, Dr. M. sent them to me for Mr. F., and I shipped the lot, consisting of six, to Philadelphia. On their arrival, Mr. F. was absent from the United States, and had transferred them to me.

Dr. Martin, in his note accompanying them, stated that they were the heads of *notorious* Thugs, who had recently been hung by direction of the Court for the suppression of Thuggee established by the E. I. Co.; and I entertain no doubt of the correctness of his statement.

As to the province of Hindoostan, to which the birth place of these six Thugs should be referred, Dr. M. said nothing, and probably knew nothing. Neither did he inform me in which district they were tried and executed; but at the period at which he procured them, Thuggee was practised much more extensively in the region about the head waters of the Ganges than in the province of Bengal; and I presume that they were obtained from the former region.

Two of the six skulls were sent by me to our late friend Dr. Samuel G. Morton, in W. A. Foster's name. I suppose them to be the same which appear in the Catalogue of Crania belonging to the Academy. Two others I presented to George Combe, of Scotland, when on a visit to our city, many years ago; and the remaining two you now have.

Mr. Lea presented for publication a paper entitled "Descriptions of twenty-seven New Species of Uniones from Georgia," which was referred to a committee.

June 30th, 1857.

Vice-President BRIDGES in the Chair.

The Committees to whom were referred the following papers, reported in favor of their publication.

Notes on the Geology of the Mauvaises Terres of White River, Nebraska.

BY F. V. HAYDEN, M. D.

This interesting lacustrine deposit has but recently been made known to the scientific world,—wonderful not alone for its unique scenery, but also for the abundance and importance of its organic remains; and although it has been as yet but partially explored, the results that have been obtained have proved of the highest interest. The profusion of Mammalian and Chelonian remains which have been entombed in its strata, of species and, in most cases, genera, though closely allied, yet differing from all known living forms, its purely fresh-
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water origin and remarkable physical features, must render it, when fully explored and studied, classic ground to the Geologist and Palæontologist. I now propose to give a brief account of the history and progress of its discovery, note the different expeditions which have visited it, and present, in as short a compass as possible, what is now known respecting its geology. The history of its exploration up to 1853 I quote from Prof. Leidy's great work, "The Ancient Fauna of Nebraska."

"This extensive cemetery of eocene vertebrata in the Mauvaises Terres, or Bad Lands, was first brought to our notice in a communication entitled, '*Description of a fossil Maxillary Bone of a Palæotherium from near White River, published by Hiram A. Prout, M. D., of St. Louis, in the American Journal of Science and Arts for 1847, page 248.*'

"Nearly at the same time Mr. S. D. Phillips, when on a visit to Chambersburgh, observed in the possession of Dr. S. D. Culbertson, several remarkable mammalian fossils, which had been sent as curiosities from the Bad Lands by his nephew, Mr. Alexander Culbertson, of the American Fur Company. These specimens, at the suggestion of the late distinguished Dr. S. G. Morton, were obtained through Dr. John H. B. McClelland, a friend of Dr. Culbertson, and were obligingly placed in my hands for examination. A description of them was published in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1847 and 1848, and they were afterward presented by Alexander Culbertson to the Academy.

"The attention of Dr. D. D. Owen having been directed to the interesting region whence the fossils were obtained, he requested Dr. John Evans, an assistant in the Geological Survey in which he was engaged, to pay it a visit. This gentleman brought home a magnificent collection of fossils, which form the basis of one of the chapters in Dr. Owen's Report.*

"Through the instrumentality of Prof. S. F. Baird, who from the first fully appreciated the importance of a complete examination of the Mauvaises Terres, and their animal remains, Mr. Thaddeus A. Culbertson, under the auspices of the Smithsonian Institution, visited the locality and brought home a valuable additional collection of Mammalian and Chelonian fossils."†

In the spring of 1853, Dr. John Evans, U. S. Geologist, made an incidental tour to the Bad Lands, while on his way to his field of labors in Oregon, and obtained a very large and valuable collection; and besides re-collecting most of the forms already discovered, added five new species to the Fauna.

At the same time another expedition was fitted out and sent to the Bad Lands through the liberality of Prof. James Hall, the eminent Geologist and Palæontologist of New York; and Mr. F. B. Meek and the writer were employed by him to perform the trip. A large and valuable collection and much information were obtained, adding greatly to our knowledge of the country. Three new species of mammals were also added to the Nebraska Fauna.

In February, 1855, while spending the winter at Fort Pierre, the writer made a tour to the Bad Lands, under the patronage of Col. A. J. Vaughan, U. S. Agent for the Upper Missouri Indians. A severe storm of snow, however, rendered it impossible for him to go beyond Sage Creek. A few mammalian remains and a fine collection of the fresh-water fossils from Pinao's Spring were the only results. In May of the same year the writer made a second trip by a route never before taken by travellers. Leaving Fort Pierre, he took a south-easterly course, struck White River about thirty miles above its mouth, crossed the stream and ascended to the dividing ridge which overlooks the valley of Running Water, on the south side of White River and the main body of the Bad Lands. An opportunity was thus given to examine the outliers and upper beds of the Bad Lands, which resulted in the discovery of several new

* See Dr. Leidy's Memoir, p. 533, of the Report of a Geological Survey of Wisconsin. &c.

† Journal of an Expedition to the Mauvaises Terres and the Upper Missouri in 1850. Fifth Annual Report of the Smithsonian Institution, page 84.

forms of Fossil Mammalia among which were four new species belonging to the family Rodentia,* a group not before discovered in this basin. A fine opportunity was thus given to trace the connection of distant outliers on both sides of the Missouri, with the main body of the Bad Lands at the head of White and Shyenne rivers.

I will now present a vertical section showing the order of superposition of the different beds at the various localities examined, premising, however, that the thickness of the strata are all estimated. The section, therefore, cannot be as perfect as could be desired, but may throw some light on the geology of that interesting region.

Vertical Section, showing the order of superposition of the different Beds of the Bad Lands of White River, so far as determined.

		SUBDIVISIONS.	LOCALITIES.	Estimated thickness.
MIOCENE TERTIARY.	Bed H.	Gray and greenish-gray sandstone, varying from a very fine compact structure to a conglomerate.	Bijou Hills, Medicine Hills, Eagle Nest Hills.	20 ft.
	Bed G.	Yellowish gray grit, passing down into a yellow and light yellow argillo-calcareous marl, with numerous calcareous concretions and much crystalline material, like Sulphate of Baryta. Fossils: Hipparion, Merychippus, Stenoeolophus, &c.	Bijou Hills, Medicine Hills, Eagle Nest Hills, and numerous localities on south side of White River, also at the head of Teton River.	50 ft.
	Bed F.	Grayish and light gray rather coarse-grained sandstone, with much Sulphate of Alumina? disseminated through it.	Along White River valley, on the south side.	20 ft.
	Bed E.	Yellowish and flesh-colored indurated argillo-calcareous bed, with tough argillo-calcareous concretions, containing Testudo, Hipparion, Stenoeolophus, Oreodon, Rhinoceros, &c.	Seen along the White River valley, on the south side.	30 ft.
	Bed D.	Yellow and light yellow calcareous marl, with argillo-calcareous concretions and slabs of silicious limestone, containing well preserved fresh-water shells.	On the south side of White River. Seen in its greatest thickness at Pinao's Spring.	40 ft.
	Bed C.	Light gray silicious grit, sometimes forming a compact fine grained sandstone.	Seen on both sides of White River. Also at Ash Grove Spring.	20 ft.
	Bed B.	A reddish flesh-colored argillo-calcareous indurated material, passing down into a gray clay, containing concretionary sandstone, sometimes an aggregate of angular grains of quartz, underlaid by a flesh-colored argillo-calcareous indurated stratum, containing a profusion of Mammalian and Chelonian remains. Turtle and Oreodon Bed.	Revealed on both sides of White River and throughout the main body of the Bad Lands.	80 feet.
	Bed A.	Light gray calcareous grit, passing down into a stratum composed of an aggregate of rather coarse granular quartz; underlaid by an ash-colored argillaceous indurated bed with a greenish tinge. Titanotherium Bed.	Best developed at the entrance of the Basin from Bear Creek. Seen also in the channel of White River.	50 ft.
OREOGENOUS SYSTEM.	Formation No. 5.	Gray and yellowish arenaceous clays and sandstones, sometimes weathering to a pink color; contains <i>Belmontella bulbosa</i> , <i>Nautilus Dekayi</i> , <i>Ammonites placenta</i> , <i>A. lobatus</i> , <i>Scaphites Omradi</i> , <i>Baculites grandis</i> , and great numbers of other Marine Mollusca.	Immediately under the Tertiary bed A at Bear Creek. Seen also at Sage Creek, head of Teton River, Moreau Trading Post, Fox Ridge, Butte aux Gres on Missouri River, mouth of Cannon Ball River.	100 to 150 feet.

*See a paper by Prof. Leidy, in the Proceedings of the Philad. Academy, for April, 1857.

In making some general remarks in regard to the geology of the Bad Lands, I propose to take Fort Pierre as the starting point, pass up the valley of the Teton River to its source, and over the Plateau, skirting the northern side of the Bad Lands, enter the basin at Bear Creek, cross White River near Ash Grove Spring, and descend the valley of White River on the south side of the Bad Lands, below its confluence with the Missouri to Bijou Hills.

Leaving Fort Pierre, on our route to the Bad Lands, we take a course a little south of west along the valley drained by the Teton River and its tributaries. This region is underlaid by Formation* No. 4 of the Cretaceous system. The surface is quite undulating, presenting the usual indications of sterility, with very little to break the monotony of the scenery until reaching Grindstone Hills, about eighty miles from our starting point, where a new feature presents itself. These hills strike the eye of the traveller on account of their peculiar form, height and the immense ledges of rock that cap their summits. These rocks present an exceedingly variable structure. Some are formed of an aggregation of quartz fragments cemented with carbonate of lime; others form a coarse-grained sandstone, or a conglomerate of water-worn pebbles mixed with angular grains of quartz. This bed is undoubtedly an outlier of the Tertiary formations of the Bad Lands. Underneath is the yellow arenaceous bed No. 5 of the Cretaceous system, and underlying this is No. 4, with its peculiar concretions and a few fossils. Scattered through the valley of the little stream that flows at the base of the hills are slabs of Tertiary limestone containing fresh-water shells of the genera *Limnea*, *Planorbis*, &c. On ascending the hills, the lofty spires of the Bad Lands first rise to view like a magnificent city imprinted on the sky. At the head of Teton River the Cretaceous bed No. 5 becomes quite conspicuous, attaining a thickness of about eighty feet. Very few fossils are found in it at this locality. I succeeded in finding a single shell and the tooth of a fish, and Mr. Meek discovered in 1853 tracks of Planarian worms. Here the country changes from dreary sterility, with poor water and grass, to a cheerful aspect, fine springs, and a comparatively luxuriant vegetation.

Ascending the high hills at this point, we pass over the broad Plateau along side of the Bad Lands, their lofty pyramids rising high above the surrounding prairie. Eight miles farther we come to Pinao's Spring, a noted camping place for travellers. Near this place a ridge extends from the Bad Lands across the prairie toward the head of opening creek, about thirty feet in height, its sides gently sloping and covered with grass. Scattered over this ridge are numerous thin slabs of whitish limestone with fresh water shells, which have been changed into a semitransparent chalcedony. There are also concretionary masses of argillaceous limestone fully charged with these fossils in a fine state of preservation. These fossils were first discovered by Drs. Evans and Shumard in 1853, and have been indicated by them in the Proceedings of the Philadelphia Academy. They consist of *Planorbis*, *Limnea*, *Physa* and a small crustacean. Several undescribed species have since been obtained from this locality, also a few teeth and jaws of Mammals, comminuted remains of fishes, and the seeds of a small species of *Chara*. The discovery of these fossils afforded us positive evidence of the lacustrine character of this deposit.

This ridge forms bed D of the vertical section, and is composed mainly of yellow and light yellow calcareous marl.

Approaching Sage creek the country becomes exceedingly broken. The Cretaceous bed No. 5 forms numerous pyramidal hills, some of them with almost vertical sides, their summits paved with well water-worn pebbles from the Drift. In the channel of Sage creek the Cretaceous bed No. 4 makes its appearance, and forms a remarkable locality for its peculiar fossils. Continuing our west-erly course, we come to Bear creek, the usual camping place of visitors to the

* See Vertical Section, in a paper by F. B. Meek and F. V. Hayden, in Proceedings of the Academy for May, 1857.

Bad Lands. Passing over the deep valley formed by this stream, we again ascend to a broad plateau which slopes gently away northward to the valley of the Shyenne. In the west the lofty range of the Black Hills is seen about sixty miles distant, like a black cloud looming up above the horizon. Turning to the left we descend about fifty feet into the basin of the Bad Lands, a large area worn out as it were by the long continued action of atmospheric agencies, the material having been carried away by Bear creek and another tributary of the Shyenne. After making our descent we pass over a portion of this denuded area two or three miles in width, which is studded with low conical hills, on the sides and at the base of which are numerous dull reddish silico-argillaceous concretions, having much the shape and appearance of huge turtles. From these concretions Messrs. Hall and Meek have described a remarkable *Baculite*, (*B. grandis*), a true Cretaceous fossil, the position of which is in the upper portion of a bed upon which the lowest stratum of the Tertiary basin of the Bad Lands rests.

Pursuing from thence a south-westerly course, we commence a gradual ascent and pass the junction of the two great Geological systems, the Cretaceous and Tertiary, into the Titanotherium bed, the lowest member of this Tertiary basin. We have, first, an ash-colored silico-argillaceous stratum with a greenish tinge, interspersed with large aggregated masses of particles of quartz, passing up into a light gray calcareous grit. In my vertical section I have concluded to throw all these strata, though presenting some lithological differences, into one bed, from the fact that the remains of the huge *Pachyderm* that has given it its name, are distributed to a greater or less extent all through it. To the *Titanotherium* may now be added another pachyderm discovered by the writer in 1855, and described by Dr. Leidy under the name of *Hyopotamus americanus*.

Passing over a nearly level denuded area about five miles in width, underlaid by this bed, he came to the Turtle and Oreodon bed, so called from the immense numbers of the remains of these animals found in it. This forms the lower member of bed B of the vertical section, and is by far the most fossiliferous portion of the Bad Lands. Besides the remains of *Oreodon* and *Testudo*, which are most abundant, many other species of vertebrates have been described by Dr. Leidy from this bed. They are found in the debris on the denuded plateau, or at the base of the Bluffs, and from the nearly perpendicular walls the Turtles often project like large colored concretions. Some of the Turtles are of large size, measuring four feet in length and three to three and a half feet in width. The most abundant species of Mammal appears to have been the *Oreodon Culbertsonii*, of which fragments of more than five hundred individuals have already been obtained from an area not over five miles square, surrounding Ash Grove Spring, which is near the central portion of the Bad Lands.

The scenery is of the most remarkable and picturesque character. No vegetation meets the eye, but on every side are high bare whitened walls, and the traveller winds his way through these labyrinthine passages as if in the gloomy apartments of some oriental sepulchre. Continuing our ascent, we come to the dividing ridge between the Shyenne and White rivers, ranging north-east and south-west through the central portion of the Bad Lands, in which the little tributaries of these two rivers take their rise. Here the Turtle and Titanotherium beds are concealed, and the upper members of this deposit are well exhibited. Descending the slope toward White River the Turtle bed again appears, and in the channel of White River a stratum of fine gray grit is seen, the upper portion of the bed containing bones of Titanotherium Prouti. Crossing White River we pass down the south side of the main body of the Bad Lands, and find that on this side the beds consist mostly of outliers holding a higher geological position than those at Bear Creek or Ash Grove Spring. Near the entrance of Mule Creek and of several of the tributaries of White River, are some beautiful exhibitions of the architectural features of the Bad Lands.]

Lands. They remind one of some ancient city with its palaces, domes and towers. At the mouth of Mule Creek we have one of the most picturesque views in this region. An area of two miles wide and six miles long has been worn away by the eroding agency of water into myriads of conical and pyramidal peaks, high sharp ridges and deep winding canons two hundred and fifty to three hundred feet in depth. The summits of these ridges are capped with layers of coarse-grained sandstone, containing many whitish particles of clay which have been dissolved out by exposure, and give to the rock the appearance of worm-eaten masses. We then have underneath the sandstone a yellowish calcareous marl passing down into a light gray grit; then the flesh-colored Turtle bed with its peculiar fossils. Most of the same organic remains are found here as at Bear Creek or Ash Grove Spring, but not near so abundant. A species of land shell, *Helix Leidyi*, a single specimen of which was discovered at Bear Creek in 1853 by Mr. Meek and the writer, occurs at this locality in great numbers. Continuing our course down the south bank of White River, we see on our left the main range of the Bad Lands rising high above the surrounding country, and extending in an easterly direction to the head of Teton River, where it ceases abruptly. On our left as far as the eye can reach we see outliers of the Tertiary exposing their whitened surfaces, and resting upon Cretaceous bed No. 5.

Nearly in a direct line south of Grindstone Hills, and near the dividing ridge between White and Running Water Rivers, we meet with a high outlier of Tertiary called Eagle Nest Hill, from the fact that an eagle has built her nest on its summit from time immemorial. This hill is about eighty feet in height above the surrounding prairie, with nearly perpendicular sides, composed mostly of indurated clay with a mixture of calcareous matter. Not far distant is another hill of the same formation, about a mile long, and covered to some extent with pines and capped with a bed of sandstone twenty to thirty feet in thickness. All around the base of these hills the Cretaceous bed No. 5 is seen with a few of its peculiar fossils.

About ten miles north east of this point, near White River, we meet with a denuded area which presents some peculiarities worthy of note. Here I observed a vertical seam of fine-grained sandstone passing through the different strata for several hundred yards, varying in thickness from four to thirty inches. Sometimes this vertical seam is left standing, the more yielding calcareous marl having been washed away from either side, and thus it forms a high perpendicular wall having much the appearance of mason work. It is composed of a fine, light gray grit, and is doubtless due to the infiltration of fine sediment in a fissure in the strata. At this locality we have, in descending order, rather fine grained gray sandstone, then a yellowish or flesh-colored calcareous marl, containing many tough argillo-calcareous concretions. This forms bed E of vertical section, and contains at this locality numerous remains of turtles and mammals. Within the space of a mile I saw of turtles—portions more or less entire—more than thirty individuals. Fragments also of *Oreodon*, *Rhinoceros* and several new species of Mammalia, one of which Dr. Leidy has described as *Steneofiber Nebrascensis*.

We continue to see quite numerous isolated patches of this deposit until reaching the forks of White River, below which point they almost entirely cease, and the river cuts deeply through Cretaceous bed No. 5 into No. 4. The alluvial bottoms are composed of the light-colored clays and sands of the Bad Lands, but the bluffs are formed of the yellow and dark ash-colored clays of the Cretaceous formation, with a few fossils, as *Baculites*, *Ammonites*, *Inoceramus*, &c. Passing down the Missouri River, the next indication of the Tertiary deposit is at Medicine Hills, about eighty miles below Fort Pierre. These are a lofty group of hills, the upper portions and sides of which are covered with large fragments of rocks, which seem to have been removed from their position by denudation. This rock holds the same geological position and is similar to that on Bijou Hills, but is, in some instances, of a

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finer and more compact silicious character, and in others a coarser conglomerate. These Hills are of considerable interest, as forming an intermediate link uniting Bijou Hills to the main body of the Bad Lands. The two upper beds of the vertical section are represented at this locality. The last outlier of this deposit is seen at Bijou Hills on the opposite side of the Missouri River in lat. $43\frac{1}{2}^{\circ}$. These are a group of isolated hills towering high above the surrounding country and forming prominent land marks for the voyager. The two highest hills border upon the river and are from four to six hundred feet in height. Farther into the interior are two other hills, the first about two miles long, and the second about eight miles, ranging in a nearly east and west course, sloping gently down toward the Coteau de Prairie. In the summer of 1853 I ascended one of the hills nearest the river in company with my friend Mr. Meek, and, from a denuded portion near the summit, we obtained several fragments of jaws and teeth belonging to two new species of mammals, which have been described by Dr. Leidy as *Hipparion speciosum* and *Merycadus necatus*. In the autumn of 1856 I discovered on the denuded summits of the same hills *Hipparion occidentalis* and two new genera, *Leptarctus primus*, an animal allied to the raccoon, and *Merychippus insignis*, a remarkable new genus of ruminant horse. These remains have all been described by Dr. Leidy in the Proceedings of the Philadelphia Academy.

The summits of these hills are capped with a bed of bluish-gray compact rock, quite variable in its character. Sometimes it is very fine, not unlike a metamorphic rock; again it is composed of an aggregation of particles of granular quartz, interspersed with a few small water-worn pebbles; then a coarse grained somewhat friable sandstone. Farther into the interior, capping the summit of the long hill, this rock may be seen in places twenty to thirty feet in thickness. The calcareous grits and marls underneath, may be subdivided in descending order thus:—

1st.—Yellowish-gray grit, with compact, fine calcareous concretions.

2nd.—Yellowish-white calcareous marl, containing great quantities of the comminuted fragments of bones.

3rd.—Compact whitish calcareous clay, with a few vertebrate remains and concreting limestone. The aggregate thickness of these beds I could not determine, as the sides of the hill were, for the most part, covered with a surface deposit of considerable thickness, sustaining a good growth of vegetation.

The foregoing notes are designed merely as preliminary to a more thorough description of the geological character of this most interesting deposit. Its Miocene age and the Miocene affinities of most of the genera and species of fossils yet obtained from it have already been discussed in an interesting paper by Prof. Leidy, published in the Proceedings of the Academy for March, also in a paper by F. B. Meek and the writer, published in the Proceedings for April.

The Zoological arrangement of the Catalogue is copied from Prof. Leidy's paper published in March last. The object of the table is simply to show as far as has been ascertained the stratigraphical position of the different fossils, and the letters are made to correspond with those representing the beds in the vertical section.

The illustrative section accompanying this paper is intended to show the relations of the Tertiary basin to the Cretaceous beds, and especially to render more clear the connections of the widely separated outliers, Medicine Hills and Bijoux Hills with the main body of the Bad Lands.

1857.]

*Catalogue of all the Fossils hitherto described from the Bad Lands of White River,
with a table showing their Stratigraphical position.*

	Beds in ascending order.						
	A	B	C	D	E	F	G
RUMINANTIA.							
1. OREODON GRACILIS, Leidy.....	..	*	..	..	..	..	..
2. OREODON CULBERTSONI, Leidy.....	..	*	..	..	*	..	*
3. OREODON MAJOR, Leidy.....	..	*	..	..	..	..	..
4. AGRIOTHERIUM MAJOR, Leidy.....	..	*	..	..	..	..	..
5. AGRIOTHERIUM ANTIQUUS, Leidy.....	..	*	..	..	..	..	..
6. PERBOTHERIUM WILSONI, Leidy.....	..	*	..	..	..	..	..
7. LEPTOMERYX EVANSI, Leidy.....	..	*	..	*	*	..	..
8. LEPTAUCHENIA DECORA, Leidy.....	..	*	..	..	*	..	..
9. LEPTAUCHENIA MAJOR, Leidy.....	..	*	..	..	..	..	..
10. PROTOMERYX HALLI, Leidy.....	..	..	..	..	*	..	..
11. MERYCODUS NEGATUS, Leidy.....	..	..	..	..	..	..	*
MULTUNGULA.							
12. CHEEROPOTAMUS (<i>Hyopotamus</i>) AMERICANUS, Leidy.....	*	..	..	..	..	..	..
13. ENTELODON MORTONI, Leidy.....	..	*	..	..	..	..	..
14. ENTELODON INGENS, Leidy.....	..	*	..	..	..	..	..
15. TITANOTHERIUM PROUTII, Leidy.....	*	..	..	..	..	..	..
16. PALAEOCHERUS PROLUS, Leidy.....	..	*	..	..	*	..	..
17. LEPTOCHERUS SPECTABILIS, Leidy.....	..	*	..	..	*	..	..
18. RHINOCEROS OCCIDENTALIS, Leidy.....	..	*	..	..	..	..	..
19. RHINOCEROS (<i>Hyracodon</i>) NEBRASCENSIS, Leidy.....	..	*	..	..	*	..	..
SOLIDUNGULA.							
20. HIPPARION OCCIDENTALE, Leidy.....	..	..	..	..	*	..	*
21. HIPPARION SPECIOSUM, Leidy.....	..	..	..	..	..	..	*
22. ANCHITHERIUM BAIRDII, Leidy.....	..	*	..	..	..	..	..
23. MERYCHIPPUS INSIGNIS, Leidy.....	..	..	..	..	..	..	*
RODENTIA.							
24. STENOPIPER NEBRASCENSIS, Leidy.....	..	..	..	..	*	..	*
25. ISCHYROMYS TYPUS, Leidy.....	..	*	..	..	..	..	..
26. PALAEOLAGUS HAYDENI, Leidy.....	..	*	..	..	..	..	..
27. EUMYS ELEGANS, Leidy.....	..	*	..	..	..	..	..
CARNIVORA.							
28. HYAENODON HORRIDUS, Leidy.....	..	*	..	..	..	..	..
29. HYAENODON CRUENTUS, Leidy.....	..	*	..	..	..	..	..
30. HYAENODON CRUCIANS, Leidy.....	..	*	..	..	..	..	..
31. AMPHICYON VETUS, Leidy.....	..	*	..	..	..	..	..
32. AMPHICYON GRACILIS, Leidy.....	..	*	..	..	..	..	..
33. MACHAIRODUS PRIMEVUS, Leidy.....	..	*	..	..	..	..	..
34. DRYINOTIS FELINA, Leidy.....	..	*	..	..	..	..	..
35. LEPTARCTUS PRIMUS, Leidy.....	..	..	..	..	..	..	*
CHELONIA.							
36. TESTUDO NEBRASCENSIS, Leidy.....	..	*	..	..	*	..	..
MOLLUSCA.							
37. HELIX LEIDYI, Hall & Meek....	..	*	..	..	..	..	..
38. PLANORBIS NEBRASCENSIS, Evans & Shumard.....	..	..	..	*	..	..	..
39. LYMBEA DIAPHANA, Evans & Shumard.....	..	..	..	..	*	..	..
40. LYMBEA NEBRASCENSIS, Evans & Shumard.....	..	..	..	..	*	..	..
41. PHYSA SECALINA, Evans & Shumard.....	..	..	..	..	*	..	..
CRUSTACEA.							
42. CYPRIS LEIDYI, Evans & Shumard.....	..	..	..	*	..	..	..

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Prodromus descriptionis animalium evertibratorum, quæ in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaller Ringgold et Johanne Rodgers Ducibus, observavit et descripsit

W. STIMPSON.

PARS. II. *TURBELLARIEORUM NEMERTINEORUM*

GENERUM ET SPECIERUM ADHUC INEDITARUM DESCRIPTIONES ;

ADJUNCTIS NOTIS DE GENERIBUS JAM CONSTITUTIS.

Characteres, ex quibus generum distinctiones pendent in hoc tribu, sunt : corporis forma, longissima v. brevior et lata, plana v. teretiuscula ; forma capituli discreti v. continui ; positio proboscidis aperturæ, (os, *Quatref.*) terminalis v. subterminalis ; et præsentia aut absentia aperturæ ventralis, (os, *Grube* ; apertura genitalis, *Quatref.*) lobarum, plicarum frontaliū, fissurarum lateraliū, et ocellorum. Aperturam parvulam (anum v. ap. genitalem) apud extremitatem corporis posteriorem describunt auctores, quam nunquam invenire potui in speciebus quas observavi.

Genera adhuc proposita sunt :

- LINEUS, Sowerby, 1804.
- TUBULANUS, Renier, 1807.
- CEREBRATULUS, Renier, 1807.
- Nemertes*, Cuvier, 1817. = LINEUS.
- Borlasia*, Oken, 1817. = LINEUS.
- LOBILABRUM, Blainville, 182-.
- Polia*, Delle Chiaje, 1823. Præoc.—*Polia*, Ochsenheim, Ins. 1816.
- OPHIOCEPHALUS, Delle Chiaje, 1823.
- Meckelia*, Leuckart, 1828. = CEREBRATULUS.
- NOTOSPERMUS, Huschke, 1830.
- MICRURA, Hemprich et Ehrenb., 1831.
- TETRASTEMMA, Hemp. et Ehrenb., 1831.
- OMATOPLA, Hemp. et Ehrenb., 1831.
- HEMICYCLIA, Hemp. et Ehrenb., 1831.
- POLYSTEMMA, Hemp. et Ehrenb., 1831.
- AMPHIPORUS, Hemp. et Ehrenb., 1831.
- Notogymnus*, Hemp. et Ehrenb., 1831. = NOTOSPERMUS.
- Tricelis*, Hemp. et Ehrenb., 1831. = NOTOSPERMUS.
- Carinella*, Johnston, 1833 ; fide ejusd. = *Meckelia*. (CEREBRATULUS.)
- Acrostomum*, Grube, 1840. (v. *Acrostoma*, Le Sauv., Verm., 1826.)
- RHAMPHOGORDIUS, Rathke, 1843.
- CEPHALOTRIX, Oersted, 1844.
- BORLASIA, Oersted, 1844.
- NEMERTES, Oersted, 1844.
- Amphiporus*, Oersted, 1844. (non Ehrenb.)
- ASTEMMA, Oersted, 1844.
- SERPENTARIA, Goodsir, 1845.
- VALENCINIA, Quatref., 1846.
- OERSTEDIA, Quatref., 1846.
- SCOTIA, R. Leuckart, 1849.
- BASEODISCUS, Diesing, 1850.
- COLPOCEPHALUS, Diesing, 1850.
- CHLAMYDOCEPHALUS, Diesing, 1850.
- PRORYNCHUS, Schultz, 1851.
- EMBA, Leidy, 1851.
- HECATE, Girard, 1852.
- POSEIDON, Girard, 1852.
- NAREDA, Girard, 1853.
- RENIERIA, Girard, 1853.
- Leodes*, Girard, 1853. = Cerebratulus.

Descriptiones specierum Expeditionis.

A. Apertura ventralis infra caput v. cervicem sita. Ocelli nulli.

a. Fissuræ laterales in capitis marginibus.

1. Corpus normale.

Genus LINEUS, Sowerby.

Corpus depressum lineare, longissimum. Caput vix subdiscretum, quadratum, antice late truncatum, apertura proboscidis terminali ampla. Apertura ventralis ante fissurarum finem posteriorem sita, sepius subterminalis.

L. longissimus, Sowerby, = *Meckelia Borlasii*, Diesing, typus est generis *Nemertes* Cuvierii et generis *Borlasia* Okenii.

1. LINEUS PIPERATUS. *Meckelia piperata*, St. Proc. Acad. Nat. Sci. Philada. vii. 381. Corpus gracile, retrorsum vix dilatatum, supra pallide fulvum, nigro punctatum et transverse notatum, fascia longitudinali mediana nigra antice interrupta; marginibus albis. Caput rectangulare, maculis duabus nigris magnis. Fissuræ sat longæ, subobliquæ, ad finem posteriorem supra visæ. Apertura ventralis parva, ovalis. Long. 8; lat. 0.1 poll.

Hab. In portu insulæ "Kikaisima" Japoniæ Australis; sublittoralis inter lapillos et algas.

Gen. CEREBRATULUS, Renier.

Corpus depressum v. teretiusculum, postice sepius plus minusve dilatatum; longitudine mediocri. Caput corpori continuum v. subdiscretum, oblongum v. elongatum; apertura proboscidis terminali minuta. Apertura ventralis sepius minor et fine posteriore fissurarum lateralium opposita. Fissuræ ad cervicem productæ. Species errantes non fossores.

Species ambæ Renieri fide Diesingii ad genus *Meckelia* auctorum pertinent. Ergo rationis nihil est quin nomen supra dictum reciperetur.

2. CEREBRATULUS IMPRESSUS. Complanatus, in medio dilatatus, utrinque subangustatus; supra griseo-fuscus, lineis impressis (v. sulcis linearibus) transversis incoloratis. Caput parvum subtruncatum corpori multo angustius, carneum, punctis fuscis prope angulos antero-laterales. Apertura ventralis contra finem fissurarum. Long. 3.8; lat. 0.35 poll.

Hab. Prope insulas freti Beringiani; in fundo limoso profunditate 20 orgyiarum.

3. CEREBRATULUS PALUDICOLUS. Depressus, utrinque obtusus, postice vix dilatatus; sanguineus, antice nigricans, postice pallens olivaceus. Caput sat latum, quadratum, ad apicem apiculatum. Apertura ventralis ad finem fissurarum lateralium. Long. 2.5; lat. 0.1 poll.

Hab. Prope urbem Sinensem "Canton;" littoralis in aquis subsalsis fluvii.

4. CEREBRATULUS OLEAGINUS. *Meckelia olivacea*, St. l. c. vii. 390. Supra convexus, antice latior, colore obscure olivaceus; postice pallidior, virens. Caput breve, continuum et equalis latitudinis corpori, fronte elliptice rotundata; apertura proboscidis rima verticali. Apertura ventralis ampla. Long. 3; lat. 0.1 poll.

Hab. Apud Promontorium Bonæ Spei; vulgaris in fundo arenoso profunditatis 15 orgyiarum.

5. CEREBRATULUS ALBOVITTATUS. *Meckelia albovittata*, St. l. c. vii. 382. Gracilis, supra viridis, subtus pallidior. Caput continuum, elongatum, subrectangulare, truncatum, quam corpus angustius; fascia transversa submediana alba; ante fasciam albo-marginatum. Fissuræ ultra fasciam longe productæ. Long. 3; lat. 0.09 poll.

Hab. Ad insulam "Loo Choo;" littoralis inter algas in rupium fissuris.

6. CEREBRATULUS CINGULATUS. *Meckelia cingulata*, St. l. c. vii. 381. Gracilis, teretiusculus; purpureo-fuscus, albo-annulatus, annulis angustis distantibus

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binis, ad decem paria. Caput discretum, corpori multo angustius, oblongum, antrorsum subattenuatum truncatum; albomarginatum, fascia transversa bilunata alba, ante medium sita. Apertura ventralis minor. Long. 4; lat. 0.12 poll.

Hab. Prope insulam Sinensem "Hong Kong;" inter lapillos e profunditate 25 orgyiarum.

7. *CEREBRATULUS FASCIATUS*. Valde depressus, retrorsum dilatatus, antrorsum subangustatus; purpureo-fuscus, lineis transversis subdistantibus albis annulatus; linea cervicali latiore. Caput oblongum subdiscretum, fronte subtruncata albomarginata. Apertura ventralis parva, elliptica, ad finem fissurarum.

Hab. Apud oras insulæ "Jesso" Japoniæ Borealis; in fundo arenoso-limoso profunditatis 4 orgyiarum.

8. *CEREBRATULUS BELLUS*. Parvus, brevis, depressus, utrinque subtruncatus, in medio vix dilatatus; supra cinereo-fuscus, fasciis aut lineis transversis ceruleo-albis ad decem ornatus; subtus albus. Caput breve, cinnabarinum. Long. 0.75; lat. 0.05 poll.

Hab. Prope oras insulæ "Jesso;" in conchis desertis e fundo limoso profunditatis sex orgyiarum.

9. *CEREBRATULUS NIGER*. *Meckelia nigra*, St. l. c. vii. 382. Elongatus, antice angustatus, e purpureo nigricans; postice depressus et subdilatatus, pallescens. Caput subdiscretum, elongatum, antrorsum angustatum, apice truncato, macula alba ad proboscidis aperturam. Long. 3; lat. 0.18 poll.

Hab. In portu Sinensi "Hong Kong;" in fundo conchoso profunditatis decem orgyiarum.

10. *CEREBRATULUS SINENSIS*. *Meckelia Sinensis*, St. l. c. vii. 382. Teretiusculus, rufo-brunneus, retrorsum parum dilatatus. Caput discretum, elongatum, antrorsum angustatum truncatum, pallide fulvum, maculis rufo-brunneis, postice confertis, antice sparsis. Long. 1.5; lat. 0.1 poll.

Hab. In portu "Hong Kong;" in fundo conchoso profunditatis 10 org.

11. *CEREBRATULUS NIGROFUSCUS*. Gracillimus, sublinearis, postice subattenuatus, depressiusculus, supra e rubro-fuscus nigricans. Caput corpori continuum, elongatum, ad frontem truncatam latitudine dimidium latitudinis occipitalis. Apertura ventralis linearis paullo pone finem fissurarum sita. Long. 5.5; lat. 0.07 poll.

Hab. Ad insulam "Ousima" Japoniæ Australis; littoralis inter lapillos.

MECKELIA, Auct. limit.

Corpus depressum, retrorsum dilatatum, interdum subplanum, marginibus acutis. Caput lanceolatum, apertura proboscidis terminali minuta. Apertura ventralis ampla, sepius paulo post finem fissurarum lateralium sita. Fossor in limo vel arena marina.

12. *MECKELIA SUBACUTA*. Antice vix depressa, carnea; postice depressa subdilatata, sanguineo-fusca, extremitate rotundata. Caput continuum, elongatum, fronte acuta. Long. 3.5; lat. 0.1 poll.

Hab. In portu "Napa" insulæ "Loo Choo;" littoralis in limo.

13. *MECKELIA ALBULA*. Depressa, alba; postice dilatata, pallide aurantiaca. Caput lanceolatum, pallide griseum, strictura discretum; apice obtuso; marginibus ad cervicem fissis. Apertura ventralis contra finem fissurarum sita. Long. 3; lat. 0.25 poll.

Hab. In mari Sinensi Boreali, lat. bor. 23°, long. orient. 115°; in fundo arenoso profunditatis 24 org.

14. *MECKELIA AUSTRALIS*. Sat grandis, crassa, depressa, marginibus acutis; colore carnea. Caput obtusum, fissuris brevioribus. Apertura ventralis grandis, antice acuta, postice bifurcata. Long. 6; lat. 0.3 poll.

Hab. In portu Jacksoni Anstraliensi; sublittoralis in arenis lapidosis.

1857.]

SERPENTARIA, Goodsir.

Meckelia affinis sed apertura ventrali majore, infra caput et ante cervicem sita. Fossores.

15. SERPENTARIA RUBELLA. *Meckelia rubella*, St. l. c. vii. 382. Brevis, postice valde dilatata, colore salmonis, pallida. Caput discretum, parvum, late lanceolatum. Fissuræ valde elongatæ, post cervicem productæ; apertura ventralis longe elliptica. Long. 2; lat. 0.3 poll.

Hab. In portu "Hong Kong;" in fundo limoso profunditatis 10 org.

2. Corpus lateribus involutis.

DIPLOPLEURA, nov. gen.

Corpus elongatum dilatatum, lateribus (pone caput) supra involutis, marginibus in linea dorsali mediana vix convenientibus. Caput subdiscretum, triangulare vel subcordatum, fissura longitudinali in utroque margine ad cervicem producta. Apertura proboscidis terminalis minuta. Apertura ventralis parvula, infra corpus, post cervicem sita subdistans. Ocelli nulli. Maricolæ.

16. DIPLOPLEURA JAPONICA; species unica, gracilis, colore helva. Long. 1.5; lat. 0.12 poll.

Hab. In sinu "Kagosima" insulæ "Kinsiu" Japoniæ; in arenis profunditatis quinque org.

δ. Fissuræ laterales nullæ.

1. Apertura proboscidis terminalis.

TÆNIOSOMA, nov. gen.

Corpus grande, longissimum, lineare, depressum, ut plurimum supra infraque lineatum. Caput vix discretum, breve, sulco indistincto (rima obsoleta v. linea impressa incolorata) longitudinali in utroque margine. Apertura ventralis parvula post-cervicalis. Species in maribus orientalibus habitantes.

A *Borlasia* differt corpore majore, minus contractile, et capite sulcis laterilibus instructo. *Borlasia quinquelineata*, Quoy et Gaimard, (Voy. de l'Astrolabe; Zool. iv. 285, Atlas, T. xxiv. f. 1—2) ad hoc genus pertinet.

17. TÆNIOSOMA SEPTEMLINEATUM. Corpus depressum, retrorsum complanatum subangustatum, supra album, lineis longitudinalibus antice septem, postice quinque ornatum; subtus bilineatum. Caput lineis supra tribus (interdum quinque,) subtus duabus. Long. bi- v. tri-pedalis; lat. 0.35 poll.

Hab. Ad insulas freti "Gaspar;" sublittorale.

18. TÆNIOSOMA ÆQUALE. Corpus lineare subobesum, cœruleo-album, lineis purpureo-nigris supra quinque (tribus v. quatuor in capite,) subtus duabus ornatum; lineis omnibus ad corporis extremitates convenientibus. Caput continuum, antrosum rotundatum. Apertura ventralis parva, multo post cervicem sita. Long. bipedalis; lat. 0.32 poll.

Hab. in sinu insulæ "Ousima;" littorale sub lapidibus.

2. Apertura proboscidis infra caput.

VALENCINIA, Quatref.

19. VALENCINIA ELEGANS. *V. annulata*, St. (non Quatref.) l. c. vii. 380. Gracilis, fere linearis, supra convexa. Caput breve, paulo latius quam corpus, late truncato, fronte in medio sinuata, lateribus rotundatis. Corpus supra purpureo-fuscum, trilineatum; lineis albis, mediana antice in fronte, lateralibus post cervicem incipientibus; et fasciis transversis albis ad 16 annulatum. Caput fascia postfrontali pallide fusca. Long. 3; corporis lat. 0.08 poll.

Hab. Prope Promontorium Bonæ Spei; inter algas in fundo arenoso profunditatis 12 org. Tubulum membranaceum format.

[June,

B. Apertura ventralis nulla. Ocelli duo vel plurimi.

a. Fissuræ v. foveæ in capitis marginibus.

DICHILUS, nov. gen.

Corpus lineare depressum, longitudine mediocre. Caput corpori continuum subquadratum, plica transversa terminali bilabiatum; labio inferiore emarginato. Ocelli duo subterminales. Cervix supra rimis obsoletis (pseudorimis) impressa. Maricolæ.

20. *DICHILUS* *obscurus*. Corpus supra pallide rubro-fulvum, maculis duabus oblongis in capite. Ocelli fusci, sat magni, subdistantes, in maculis siti. Pseudorimæ cervicales tres; una mediana longitudinalis, ex cujus mediâ aliæ versus marginem utrinque oblique extendunt. Long. 3; lat. 0.08 poll.

Hab. In portu insulæ "Ousima;" littoralis inter lapillos.

TETRASTEMMA, Hemp. et Ehrenb.

Corpus filiforme teretiusculum v. lineare depressum; longitudine mediocre. Caput discretum v. subdiscretum, fovea transversa in media utriusque lateris; fronte truncata; apertura proboscidis in rima transversa terminali. Ocelli quatuor, duo postfrontales ante foveas; duo occipitales. Maricolæ.

T. Navidum, H. et E. typus est;—"pone primos oculos levis incisura distinguitur, quæ forte capitis limites indicat." *Polia sanguis rubra, coronata, vermiculus*, et *humilis*. Quatref. mihi videtur ad hoc genus pertinent.

21. *TETRASTEMMA* *stigmatum*. Parvum, teretiusculum, gracile; pallide aurantiacum. Caput discretum, paullo longius quam latum, antice subattenuatum; foveis validis; pone ocellos anteriores fascia transversa obscure rubra. Ocelli posteriores paullo majores. Long. 1; lat. 0.05 poll.

Hab. In sinu "Hakodadi" insulæ "Jesso;" in fundo limoso et algoso profunditatis 6 org.

22. *TETRASTEMMA* *incisum*, St. l. c. vii. 380. Corpus parvum teretiusculum, utrinque subattenuatum; pallide fuscum. Caput quadratum, dimidiam partem longius quam latum; strictura discretum; foveis interocularibus stricturæ similibus. Ocelli æquales. Long. 0.4; lat. 0.025 poll.

Hab. Prope Promontorium Bonæ Spei; in fundo arenoso et algoso profunditatis 12 org.

CEPHALONEMA, nov. gen.

Corpus teretiusculum filiforme. Caput rhomboidale, antrorsum subconicum; strictura discretum; fovea transversa in utroque latere. Apertura proboscidis terminalis. Ocelli duo occipitales. Maricolæ.

23. *CEPHALONEMA* *brunnicornis*. Corpus subpellucidum pallide flavo-carneum; gracile, retrorsum attenuatum. Caput antice obscure fuscum, postice fulvum; fascia transversa alba ante ocellos; fronte lineis tribus albis notata. Long. 2; lat. 0.05 poll.

Hab. In portu Sinensi "Hong Kong;" sublittorale sub lapidibus in limo.

EMPLECTONEMA, nov. gen.

Corpus longissimum subfiliforme, depressum, proteum. Caput subdiscretum, stricturis nullis; fovea longitudinali in utroque margine antero-laterali. Ocelli plurimi. Maricolæ.

E. camillea. *Borlasia camillea*, Quatref., Voy. en Sicile, ii. pl. x. f. 4, 5.

24. *EMPLECTONEMA* *viride*. Corpus depressum, lineare v. proteum, supra viride, subtus album. Caput subdiscretum, marginibus albis; foveis elongatis bipartitis; fronte emarginata. Ocellorum acervi quatuor; posteriores distincti, rotundati, ocellis confertis; anteriores marginales juxta foveas, ocellis sparsis. Long. 11; lat. 0.05 poll.

Hab. In portu "San Francisco;" littoralis inter lapillos.

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b. Foveis nullis.

1. Ocelli duo.

DIPLOMMA, nov. gen.

Corpus depressiusculum. Caput discretum, fronte emarginata, apertura proboscidis terminali. Fissuræ laterales nullæ. Ocelli duo; singulus bilobatus, quasi ex duabus constatus. (Cerebella cervicalia, valde remota. Cavum intestinale angustius; cava genitalia ampla.) Maricolæ.

25. DIPLOMMA SERPENTINA. *Nareda serpentina*, St. l. c. vii. 338. Corpus elongatum gracile, fere lineare, antrorsum vix attenuatum; supra pallide rubrum, linea mediana brunnea. Caput subovatum; sinu apertura proboscidis magno. Ocelli magni, sat remoti, in media parte capitis oblique siti, retrorsum convergentes. Cerebella rosea. Long. 3; lat. 0.05 poll.

Hab. Ad littora insulæ "Loo Choo;" sub lapidibus in locis arenoso-limosi.

DICELIS, nov. gen.

Corpus lineare, depressiusculum, utrinque obtusum. Caput continuum vel subdiscretum, fronte emarginata, apertura proboscidis terminali. Ocelli duo simplices, rotundati, subterminales. Maricolæ.

26. DICELIS RUBRA. Subfiliformis, depressiuscula, antice subattenuata; colore rubra vel purpurea. Cervix quam caput vix angustior. Caput antice rotundata et emarginata. Ocelli duo parvi subterminales. Long. 1.5; lat. 1.03 poll.

Hab. Prope insulam "Tanega" Japoniæ Australis; inter Balanos et spongas saxatiles e profunditate 12 org.

2. Ocelli plurimi.

POLYSTEMMA, Hemp. et Ehrenb., Diesing; non Oersted.

Caput strictura a corpore discretum, parte anteriore subcontracta, valde extensibili, extremitate obtusa, apertura proboscidis terminali. (Cauda sepius non dilatata; specimen unicum Ehrenbergii forsitan postice deformatum sit.)

27. POLYSTEMMA SINUOSUM. Gracile, depressiusculum, album, interdum carneo-tinctum; capite subelongatum. Ocelli sat magni, magnitudine variabiles; duo in capitis parte posteriore; plurimi sparsi in parte anteriore, qui in acervos quatuor irregulariter aggregati, posteriores minores. Long. 1.15; lat. 0.08 poll.

Hab. In portu "Hong Kong;" inter conchas desertas e prof. 10 org.

POLINA, nov. gen.

Corpus valde contractile, depressiusculum, longitudine mediocre. Caput discretum v. subdiscretum, strictura nulla; apertura proboscidis terminali in margine frontali inferiore. Proboscis lævis. Ocelli in acervos quatuor aggregati. Maricolæ.

28. POLINA RHOMBOIDALIS. *Polia rhomboidalis*, St. l. c. vii. 390. Corpus depressiusculum, antrorsum latius, colore pallida rubrum, fasciis duabus longitudinalibus inconspicuis. Caput parvum, subdiscretum, breve, antice rotundatum. Ocelli quatuor in utroque acervo, in rhombum dispositi; acervi posteriores minores, in maculis obscurioribus siti. Long. 1; lat. 0.05 poll.

Hab. In portu Jacksoni Australiensi; littoralis sub lapidibus.

29. POLINA GRISÆA. *Polia grisea*, St. l. c. vii. 390. Corpus sat longum depressiusculum, in extentione subcylindricum, colore pallide griseum. Caput discretum, ovatum v. subcordatum, quam corpus angustius, antice acutum. Ocellorum acervi anteriores majores, elongati, in parte antero-laterali capitis submarginales dispositi; ocelli decem in utroque acervo. Acervi posteriores cervicales, parvi, lineares; utroque quatuor ocelli. Long. 0.8; lat. 0.04 poll.

Hab. In portu Virginiano "Norfolk;" sublittoralis inter ulvas in locis limosis.

[June,

30. *PELMA CERVICALIS*. Corpus gracile, supra salmonæa. Caput discretum late rhomboidale, antice obtusum et emarginatum. Ocelli minuti, in acervos quatuor confluentes aggregati; anterioribus elongatis lateralibus; posterioribus rotundatis sublateralibus. Cervix bene angustata. Long. 3; lat. 0.09 poll.

Hab. In portu "Simoda" Japoniæ; littoralis inter lapides.

TATSUNOSKIA, nov. gen.

Corpus depressum. Caput subdiscretum. Apertura proboscidis terminalis cruciata. Ocelli in acervos duos lineares, antice convergentes; posteriores usque majores. Maricolæ.

In honorem cl. TATSUNOSKII, viri Japonensis eruditi et nobilis.

31. *TATSUNOSKIA DEPRESSA*. Corpus depressum, in contractione latum, supra cinnabarinum, lateribus obscurioribus. Caput parvum, obtusum, fronte emarginata; apertura proboscidis parva cruciata. Ocelli fusci, minus conspicui, sex in utroque acervo. Long. 1.2; lat. 0.15 poll.

Hab. In portu "Hakodadi" insulæ "Jesso;" in fundo arenoso, e 6-10 org. profundo accepta.

COSMOCEPHALA, nov. gen.

Corpus depressum, longitudine mediocri, minus contractile. Caput continuum v. subdiscretum, maculis angularibus v. fasciis sepius ornatum. Apertura proboscidis in margine frontale inferiore sita. Proboscis lavis. Cervix utrinque pseudorimæ inconspicuis (lineis impressis incoloratis) instructus. Ocelli minus conspicui, ut plurimum in margine capitis antero-laterali dispositi. Species maricolæ, maxima ex parte boreales.

32. *COSMOCEPHALA BERINGIANA*. Corpus sat elongatum, depressiusculum, supra cervinum, subtus pallide aurantiacum. Caput vix subdiscretum, breve, quam corpus angustius, antice rotundatum et emarginatum, cervinum, maculis angularibus albis in fronte et lateribus; fascia transversa angusta alba, retrorsum convexa, in cervice. Ocelli numerosi, utrinque in acervos duos dense aggregati. Caput infra pseudorima longitudinali mediana; pseudorimæ cervicales inferiores, una transversa utrinque sita, quæ in medio vix confluentes. Long. 3; lat. 0.2 poll.

Hab. In freto Beringiano; e fundo subuloso profunditatis 5 org.

33. *COSMOCEPHALA JAPONICA*. Corpus subelongatum, utrinque obtusum; lateribus in extensione fere parallelis. Color supra brunnea, subtus alba; caput linea mediana et maculis minutis irregularibus incoloratis; fronte, et maculis cervicalibus triangularibus, albis. Caput breve subdiscretum, fronte rotundata, ad aperturam profunde fissa. Cervix utrinque pseudorima obliqua, antorsum curvata. Ocelli sat magni, in capitis marginibus antero-lateralibus. Utrinque 10-15. Long. 4; lat. 0.18 poll.

Hab. In portu "Simoda;" littoralis in rupium fissuris et sub lapidibus.

Descriptions of two new genera of Shells.

BY T. A. CONRAD.

GONIDEA.

Shell angular, elongated; hinge furnished with a short, obtuse cardinal tooth, fitting into a corresponding depression in the cardinal plate; tooth obsolete in the left valve; anterior muscular impressions not confluent, lower accessory impressions opposite the middle of the large impression.

1. *ANODON RANDALLI*, Trask. Proceed. Califor. Acad. Nat. Sc. vol. i. p. 28.

2. *A. FEMINALIS*, Gould. The anterior muscular impressions have a relative position more nearly resembling that of *Triguera* than *Unio* or *Anodon*. The 1857.]

genus is founded on a shell which inhabits Sacramento River, California. Perhaps *Anodonta angulata*, Lea, may be included in this genus.

CALYPTRAPHORUS.

Shell subfusiform; spire acutely rostrated; beak straight, very slender; labrum with a sinus at summit and base, elsewhere entire; a calcareous deposit covers the entire shell within and without.

Allied to *Rostellaria*, Lam.

1. *CALYPTRAPHORUS VELATUS*. (*Rostellaria*) Con. Tert. Fossils, p. 38, pl. 15, fig. 4.

2. *C. TRINODIFERUS*. n. s. Subfusiform, with three distant nodes on the upper part of the body volution; spire subtriangular, having curved longitudinal ribs visible beneath the tunic; rostrum of the spire elongated and curved; labrum with a prominent angle above.

From the Eocene of Alabama. Mr. Showalter.

This genus at present is known only in Eocene deposits.

Rectification of some of the generic names of American Tertiary Fossils.

BY T. A. CONRAD.

RIMELLA, Agaz.

R. LAQUEATA, Con. (*ROSTELLARIA*.)

ANALAX, Roissy.

A. STAMINEA, Con. (*OLIVULA*.)

AXINÆA, Poli.

A. FILOSA, Con. Inadvertently referred to *Glossus* in the Proceedings and in Wailes' Geology of Miss.

DIPLODONTA, Phillipi.

D. ACCLINIS, Con., *ELEVATA*, Con., in the Miocene; *ungulina*, *Nitens inflata* in the Eocene. (*MYSLA*, *LORIPES*, *LUCINA*, inadvertently *CYCLAS*.)

JANIRA, Schum.

J. HUMPHREYSII, Con., *J. POULSONI*. (Pecten.) Referred also to *NEITHRA*, but in my opinion that genus should be restricted to the Cretaceous forms of which *N. quinquecostata* is the type.

BUSYCON, Botton.

In the Proceed. 1854, p. 30, the above is printed *BUSYCON*, a typographical error copied from Gray's Synopsis.

Description of a new species of MYACITES.

BY T. A. CONRAD.

MYACITES, Schlottheim.

M. PENNSYLVANICUS. Ovato-trigonal; ventricose; beaks submedial, anterior sides shortest, subcuneiform, extremity obliquely truncated above? posterior margin obtusely rounded, subangulated at junction with basal margin which is not greatly curved; beak not prominent; surface marked with very fine unequal closely-arranged concentric lines; substance of shell pearly and iridescent. Length $\frac{1}{2}$ inch.

Locality. Phoenixville, Pennsylvania.

Occurs in the Black shale with two species of *Posidonia*.

[June,

Description of a new genus of the family DREISSENIDÆ.

BY T. A. CONRAD.

MYTILOPSIS.

Shell mytiliform, attached by a byssus; hinge with a septum, beneath which on the cardinal side is a triangular cup-shaped process; cartilage groove rather deep.

MYTILUS LEUCOPHÆATUS, Con. Journ. Acad. Nat. Sciences, vol. vi. p. 263, pl. 11, fig. 13.

This singular bivalve inhabits the rivers of Virginia and probably further south, where the water is brackish, resembling *Cyrena* in that respect, and it is found in great abundance attached by its byssus to *Ostrea Virginiana*. The hinge resembles that of *Septifer* and *Dreissena*, with the addition of a singular cap-shaped, thin, white appendage, which projects obliquely towards the cavity of the valves. Another species inhabiting St. Domingo has been figured and described by Recluz as *Dreissena Domingensis*.

Notices of some Remains of Extinct Fishes.

BY JOSEPH LEIDY, M. D.

1. HADRODUS PRISCUS, Leidy.

The genus and species are founded upon the fragment of a bone with two teeth, apparently of a Pycnodont fish allied to *Placodus*, obtained by Dr. William Spillman, from a cretaceous deposit in the neighborhood of Columbus, Mississippi.

The fragment of bone is about $1\frac{1}{2}$ inches in depth and breadth, and about $\frac{3}{4}$ of an inch in thickness; is convex on the outer side; and presents large reserve cavities on the inner side at the base of the two teeth which are coossified with one of the borders of the bone. The teeth present a remarkable resemblance to premolars of a pachydermatous mammal. They are quadrate, and are about as broad as they are high, and about half the thickness. They are bilobed at the triturating surface, which slopes inwardly; and are invested with smooth enamel, which extends twice the depth externally that it does internally. The two teeth differ a little in form and size. Their height externally is 8 lines; the breadth of one 8 lines; of the other 7 lines; and the thickness of both is 4 lines, except the distal lobe of the larger tooth which is 5 lines.

2. PHASGANODUS DIRUS, Leidy.

This genus and species are founded upon a much mutilated dental bone with teeth imbedded in a hard mass of sandstone, discovered in Nebraska, by Dr. F. V. Hayden. The specimen I suspect to have been obtained from a cretaceous deposit.

The dental bone in its perfect condition has been about 6 inches in length, and 2 inches in depth posteriorly. To the dentary border, so far as can be ascertained, there have been six large, coossified, sabre-shaped teeth. The trenchant border is directed outwardly; and the obtuse, inner, concave border is longitudinally ridged. The first tooth visible is about $\frac{3}{4}$ of an inch from the end of the jaw, and has been about $1\frac{1}{2}$ inches long. The second tooth was situated about 1 inch posterior to the first, and was about $\frac{3}{4}$ of an inch long. The third tooth, the best preserved in the specimen, about $\frac{1}{2}$ an inch behind the second, has a strong conical base, and it is 10 lines long. The succeeding teeth decrease in size, and are at irregular distances apart. The specimen I suspect to belong to a scomberoid fish allied to *Enchodus*.

3. TUSSEODUS ACUTUS, Leidy.

This genus and species are founded upon a left dental bone with teeth, pro-
1857.]

bably of a ganoid fish, which I obtained from the black shale, of what have been usually considered the triassic rocks, from near Phoenixville, Chester Co., Pa.

The dental bone is 20 lines long, by 4 lines in depth posteriorly. It is straight, and its outer surface is covered with fine, interrupted ridges, such as are observed upon small ganoid scales, found in the same series of rocks at Gwynned, on the North Pennsylvania Railroad.

Upon the dental border of the specimen there may be counted the remains of 20 teeth, situated at irregular distances apart. They have measured from $\frac{1}{4}$ to 1 line long. They are columnar in form, slightly curving inward; have a spreading base; and an abrupt, conical, enamel summit. The fish may be allied to *Belonostomus* or *Eugnathus*, but I am unable to ascertain the exact form of the teeth in these genera.

4. *Pyromodus robustus*, Leidy.

The species is founded upon a single large tooth obtained by Prof. G. H. Cook, from the green sand of New Jersey.

The specimen is $14\frac{1}{4}$ lines long and $3\frac{1}{2}$ wide.

Examination of ENARGITE from New Grenada.

BY WM. J. TAYLOR.

I received from Jos. A. Clay, Esq., a fellow member of the Academy, a mineral which proves on examination to be Enargite. Mr. Clay received this in a box of minerals from South America; it was labelled "an antimonial silver ore from the mines of Santa Anna, New Grenada;" there were several other minerals accompanying it from the same locality.

Enargite was, I believe, first found in the Cordilleras of Peru, and mineralogists were surprised a few weeks since by Dr. Genth's determining a small specimen of a mineral found by the State Geologist of South Carolina, Oscar M. Leiber, Esq., from the "Brewers' Mine," to be of the same species. ("Contributions to Mineralogy," by Dr. F. A. Genth, American Journ. Sci. and Arts, May, 1857, p. 420.) The fact of its occurring at another locality will not be without interest.

The structure of the massive portion of the mineral is columnar, and it is intermixed with a quartose rock and pyrites, in which small cavities occur, filled with the crystallized Enargite, some of which are very distinct. The Enargite is very brittle, its color a greyish black with streaks of the same color; the powdered mineral is very crystalline with a metallic lustre. Before the blowpipe it decrepitates; on charcoal, gives the odor of arsenic and a very slight incrustation of antimony; with carbonate of soda, gives hepar and metallic copper.

The analysis I made in the laboratory of Dr. F. A. Genth, from a small portion of the perfectly pure massive mineral, of which 0.7082 grammes were treated with aqua regia and gave the following results:

	Per cent.
Sulphur.....	34.50
Copper	46.62
Arsenic.....	16.31*
Antimony.....	1.29
Iron.....	0.27
	98.99

The atomic proportion is:

Sulphur.....	2.16
Copper.....	1.47
Arsenic	} 0.23
Antimony }	

*There was a slight loss of the arsenic.

From which is obtained the formula of $6\text{CuS}, \text{As}_2\text{S}_3$

	Equivalents.	Atomic weight.	Calculated percentage.
Copper	6	189.6	46.40
Sulphur	9	144.0	35.24
Arsenic	1	75.0	18.36

From the above formula it seems not improbable that Enargite and Stephanite are isomorphous.

Descriptions of Twenty-Seven New Species of UNIONES from Georgia.

BY ISAAC LEA.

UNIO SUBGIBBOSUS. Testâ lævi, ellipticâ, compressâ, valdè inæquilaterali, posticè subangulatâ; valvulis crassis, planulatis; natibus vix prominentibus; epidermide tenebroso-olivaceâ, striatâ, obsoletè radiatâ; dentibus cardinalibus parvis, brevis-crassisque; lateralibus longis, crassis curvisque; margaritâ vel albâ vel salmonis colore tinctâ.

Hab. Oostenaula River, Floyd County, and Etowah River, Georgia. Rev. G. White.

UNIO SAVANNAHENSIS. Testâ lævi, oblongâ, inflatâ, ad latere planulatâ, posticè obtusè angulatâ, inæquilaterali; valvulis subcrassis, anticè crassioribus; natibus prominulis; epidermide rufo-fuscâ vel tenebroso-fuscâ, obsoletè radiatâ; dentibus cardinalibus subgrandibus, pyramidatis, in utroque valvulo duplicibus; lateralibus prælongis, lamellatis curvisque; margaritâ vel albâ vel pallidâ purpureâ vel salmonis colore tinctâ et iridescente.

Hab. Savannah River, also Brantley's Mill, Washington County, Georgia. Rev. G. White, Sugar Creek, Mecklenburg County, N. C. C. M. Wheatley.

UNIO VIRENS. Testâ lævi, oblongâ, subinflatâ, posticè obtusè angulatâ valdè inæquilaterali; valvulis subtenuibus, anticè crassioribus; natibus parvis prominulis; epidermide virido-olivâ, striatâ, vittatâ, eradiatâ; dentibus cardinalibus parvis, erectis, subcompressis crenulatisque; lateralibus prælongis, lamellatis rectisque; margaritâ cœruleo-albâ et iridescente.

Hab. Georgia. Rev. G. White.

UNIO SUBLATUS. Testâ lævi, transversâ, ad latere compressâ, posticè angulatâ, valdè inæquilaterali; valvulis subcrassis; natibus prominulis, ad apices undulatis; epidermide tenebroso-fuscâ, valdè radiatâ; dentibus cardinalibus parvis, subpyramidatis, crenulatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subrectisque; margaritâ purpureâ et iridescente.

Hab. Uchee Bar, below Columbus, Georgia. Bishop Elliott.

UNIO OBNUBILUS. Testâ lævi, ellipticâ, compressâ, posticè biangulatâ, inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscâ, eradiatâ, subnitens; dentibus cardinalibus subgrandibus, subpyramidatis, crenulatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis curvisque; margaritâ purpureâ et iridescente.

Hab. Buckhead Creek, Burke County, Georgia. Bishop Elliott.

UNIO OPACUS. Testâ lævi, ellipticâ, subcompressâ, posticè biangulatâ, inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide vel tenebroso-fuscâ vel nigricante, subnitens; dentibus cardinalibus subgrandibus, elevatis, subpyramidatis crenulatisque; lateralibus longis, lamellatis subrectisque; margaritâ purpureâ et iridescente.

Hab. Buckhead Creek, Burke County, Georgia. Bishop Elliott.

UNIO SIMILIS. Testâ lævi, ellipticâ, subinflatâ, posticè subbiangulatâ, valdè inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide tenebroso-

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fuscâ, radiatâ, politâ; dentibus cardinalibus subgrandibus, subelevatis, et subpyramidatis; lateralibus sublongis subcurvisque; margaritâ vel purpureâ vel salmonis colore tinctâ et iridescente.

Hab. Buckhead Creek, Burke County, Georgia. Bishop Elliott.

UNIO ÆQUATUS. Testâ lævi, ellipticâ, compressâ, posticè biangulatâ et planulatâ, valdè inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide tenebroso-castaneâ, radiatâ, ad umbones politâ; dentibus cardinalibus subgrandibus, paulisper elevatis crenulatisque; lateralibus sublongis, lamellatis subrectisque; margaritâ vel albâ vel salmonis colore tinctâ et iridescente.

Hab. Buckhead Creek, Burke County, Georgia. Bishop Elliott.

UNIO NAVICULOIDES. Testâ lævi, transversâ, subinflâtâ, posticè biangulatâ, valdè inæquilaterali; valvulis subtenuibus; natibus prominulis; epidermide tenebroso-fuscâ, striatâ; dentibus cardinalibus parvisculis, compressis, trigonis, in utroque valvulo duplicibus crenulatisque; lateralibus prælongis, lamellatis subrectisque; margaritâ purpureâ et iridescente.

Hab. Buckhead Creek, Burke County, Georgia. Bishop Elliott. Macon. I. C. Plant.

UNIO VIRIDICATUS. Testâ lævi, suboblongâ, subcompressâ, posticè compressâ, biangulatâ, valdè inæquilaterali; valvulis subtenuibus; natibus prominulis, ad apices rugoso-undulatis; epidermide virescente, politâ, eradiatâ; dentibus cardinalibus parvis, subcompressis crenulatisque; lateralibus prælongis, lamellatis subrectisque; margaritâ cœruleo-albâ et iridescente.

Hab. Buckhead Creek, Burke County, Georgia. Bishop Elliott.

UNIO SUBFLAVUS. Testâ lævi, ellipticâ, compressâ, posticè subbiangulatâ, inæquilaterali; valvulis crassis; natibus prominulis; epidermide vel luteolâ vel luteo-castaneâ vel obsoletè radiatâ vel eradiatâ; dentibus cardinalibus parvis, subconicis, crenulatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subcurvisque; margaritâ vel salmonis colore tinctâ vel albidâ et iridescente.

Hab. Walnut Creek, above Macon, Georgia. Bishop Elliott and I. C. Plant.

UNIO SUDUS. Testâ lævi, ellipticâ, subinflâtâ, posticè obtusè angulatâ, inæquilaterali; valvulis subtenuibus, anticè crassioribus; natibus subprominentibus, ad apices undulatis; epidermide luteolâ, valdè radiatâ; dentibus cardinalibus parvis, compressis, lamellatis, in utroque valvulo duplicibus; lateralibus sublongis, lamellatis subrectisque; margaritâ vel albâ vel salmonis colore tinctâ et valdè iridescente.

Hab. Dry Creek, near Columbus, Georgia. Bishop Elliott. Macon. I. C. Plant.

UNIO TETRIGUS. Testâ lævi, ellipticâ, valdè compressâ, posticè biangulatâ, inæquilaterali; valvulis crassiusculis; natibus prominulis; epidermide rugoso-striatâ, tenebroso-fuscatâ, obsoletè radiatâ; dentibus cardinalibus parvis, conicis, in utroque valvulo subduplicibus; lamellatis sublongis subcurvisque; margaritâ purpurascens et iridescente.

Hab. Flint River, near Albany, Georgia. Bishop Elliott.

UNIO WOODWARDIUS. Testâ lævi, triangulari, tumidâ, posticè angulatâ, ad latere planiusculâ, inæquilaterali; valvulis crassis, anticè crassioribus; natibus elevatis; epidermide luteo-olivâ, striatâ, radiis maculatis; dentibus cardinalibus parvisculis crassisque; lateralibus percrassis, crenulatis rectisque; margaritâ argenteâ et iridescente.

Hab. Etowah and Connasauga Rivers, Cass County, Georgia. Bishop Elliott and Rev. G. White.

[June,

UNIO TENEBRICUS. Testâ lævi, ellipticâ, subinflatâ, posticè obtusè angulatâ, inæquilaterali; valvulis tenuibus, anticè crassioribus; natibus prominulis; epidermide tenebroso-fuscâ, obsolete radiatâ; dentibus cardinalibus parvis, valdè crenulatis, in utroque valvulo duplicibus; lateralibus lamellatis curvisque; margaritâ vel purpureâ vel salmonis colore tinctâ et iridescente.

Hab. Etowah River, Georgia. Bishop Elliott and Rev. G. White.

UNIO RUFUS. Testâ lævi, transversâ, valdè compressâ, ad latere planulatâ, posticè obtusè angulatâ, valdè inæquilaterali; valvulis subcrassis; natibus prominulis, acuminate; epidermide rufo-fuscâ, eradiatâ; dentibus cardinalibus parvis, obtuso-conicis crenulatisque; lateralibus sublongis, subcrassis curvisque; margaritâ cœruleo-albâ et iridescente.

Hab. Etowah River, Cass County, Georgia. Bishop Elliott.

UNIO MODICUS. Testâ lævi, obliquâ, subinflatâ, postice subbiangulatâ, valdè inæquilaterali; valvulis crassis, anticè crassioribus; natibus subprominentibus, ad apices rugoso-undulatis; epidermide tenebroso-fuscâ, eradiatâ; dentibus cardinalibus subgrandibus crenulatisque; lateralibus curtis, crassis subcurvisque; margaritâ vel albâ vel pallido-salmonis colore tinctâ et iridescente.

Hab. Chattahoochee River, near Columbus, Georgia. Bishop Elliott.

UNIO DENIGRATUS. Testâ lævi, ellipticâ, subinflatâ, ad latere planulatâ, inæquilaterali; valvulis subtenuibus, anticè crassioribus; natibus prominulis; epidermide nigricante, eradiatâ et micante; dentibus cardinalibus parvis, pyramidalis crenulatisque; lateralibus sublongis, lamellatis subcurvisque; margaritâ vel purpureâ vel salmonis colore tinctâ et iridescente.

Hab. Streams near Columbus, Georgia. Bishop Elliott.

UNIO FUMATUS. Testâ lævi, ellipticâ, compressâ, posticè biangulatâ, inæquilaterali; valvulis subtenuibus; natibus subprominentibus; epidermide tenebroso-fuliginosâ et eradiatâ; dentibus cardinalibus parvisculis crenulatisque; lateralibus sublongis, subcrassis subrectisque; margaritâ purpurecente et valdè iridescente.

Hab. Chattahoochee River, near Columbus, Georgia. Bishop Elliott. Hospaliga Creek, Alabama. Dr. Neisler.

UNIO PURPURELLUS. Testâ lævi, oblongâ, subinflatâ, ad latere planulatâ, posticè biangulatâ, valdè inæquilaterali; valvulis crassiusculis; natibus prominulis; epidermide tenebroso-fuscâ et posticè obsolete eradiatâ; dentibus cardinalibus parvisculis, crenulatis, in utroque valvulo subduplicibus; lateralibus prælongis, lamellatis subcurvisque; margaritâ purpureâ et valdè iridescente.

Hab. Flint River, near Albany, Georgia. Bishop Elliott.

UNIO PENICILLATUS. Testâ posticè plicatâ, ellipticâ, subinflatâ, posticè subbiangulatâ, inæquilaterali; valvulis crassiusculis, anticè crassioribus; natibus subprominentibus; epidermide luteolâ, radiis penicillatis indutis, politâ; dentibus cardinalibus crassiusculis, crenulatis, subpyramidalis; lateralibus sublongis, subcrassis subrectisque; margaritâ vel albâ vel roseâ vel salmonis colore tinctâ et valdè iridescente.

Hab. Chattahoochee, near Columbus, Georgia. Dr. Boykin. Near Atlanta. Bishop Elliott. Flint River, near Albany, Georgia. Bishop Elliott and Rev. G. White.

UNIO PLANTH. Testâ lævi, regulariter ellipticâ, valdè compressâ, inæquilaterali; valvulis subcrassis, anticè crassioribus; natibus prominulis; epidermide tenebroso-castaneâ, eradiatâ; dentibus cardinalibus parvisculis, subdepressis, obtuso-conicis crenulatisque; lateralibus prælongis, subcrassis curvisque; margaritâ salmonis colore tinctâ et valdè iridescente.

Hab. Flint River, near Macon, Georgia. I. C. Plant.

UMIO SUBNIGER. Testâ lævi, ellipticâ, subcompressâ, inæquilateralâ, posticè obtusè angulatâ; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscâ, nigricante, striatâ, eradiatâ; dentibus cardinalibus parviusculis, erectis, conicis crenulatisque; lateralibus prælongis, lamellatis curvisque; margaritâ albâ et iridescente.

Hab. Flint River, near Macon, Georgia. I. C. Plant.

UMIO BULBOSUS. Testâ lævi, obliquâ, valdè inflatâ, valdè inæquilateralâ, posticè obtusè angulatâ; valvulis crassis, anticè crassioribus, natibus ———; epidermide nigricante, micante, eradiatâ; dentibus cardinalibus subgrandibus, subpyramidalis crenulatisque; lateralibus curtis, subcrassis subrectisque; margaritâ vel albâ vel salmonis colore tinctâ et iridescente.

Hab. Flint River, near Macon, Georgia. I. C. Plant and H. M. Neisler, M. D.

UMIO MACONENSIS. Testâ lævi, valdè transversâ, subcompressâ, ad latere planulatâ, valdè inæquilateralâ, posticè subbiangulatâ; valvulis subtenuibus; natibus prominulis; epidermide nigricante, obsoletè radiatâ; dentibus cardinalibus parviusculis, compressis, acuminatis, crenulatis, in utroque valvulo duplicibus; lateralibus prælongis, lamellatis rectisque; margaritâ purpurascente et iridescente.

Hab. Flint River, near Macon, Georgia. I. C. Plant.

UMIO OBRUSCUS. Testâ lævi, regulariter ellipticâ, inflatâ, posticè rotundatâ, inæquilateralâ; valvulis subtenuibus; natibus subprominentibus; epidermide tenebroso-fuscâ, nigricante, obsoletè radiatâ, subpolitâ; dentibus cardinalibus subcompressis, crenulatis, in utroque valvulo duplicibus; lateralibus lamellatis, sublongis subcurvisque; margaritâ paulisper salmonis et valdè iridescente.

Hab. Flint River, near Macon, Georgia. I. C. Plant.

UMIO AQUILUS. Testâ lævi, transversâ, subcompressâ, posticè angulatâ, valdè inæquilateralâ; valvulis crassiusculis; natibus prominulis, ad apices rugoso-undulatâ; epidermide tenebroso-fuscâ, nigricante, obsoletè radiatâ, transversè striatâ; dentibus cardinalibus parviusculis, subelevatis crenulatisque; lateralibus prælongis, lamellatis subrectisque; margaritâ vel purpureâ vel albâ et valdè iridescente.

Hab. Flint River, near Macon, Georgia. I. C. Plant.

[June,

July 7th.

Vice-President BRIDGES in the Chair.

The following papers were presented for publication, viz :

On three new species of Vespertilionidæ, by John LeConte.

Observations on the Wild Turkey, by John LeConte.

Referred to committees, as usual.

Mr. Lea called attention to the specimen of Chryastolite from the White Mountains, presented by Dr. LeConte and himself.

Mr. Lea also made some observations on the geology of the red sandstone formation near Gwynned, whence the specimens alluded to by Dr. Leidy, at the meeting of June 16th, were obtained. It is identical with that of Phoenixville, Pa. Mr. Lea alluded to the identity of a large fish scale found by him at Gwynned about two years since, with that figured by Emmons as *Radiolepes speciosus*, from the Chatham series, N. C., as proving the identity of the formations.

July 14th.

Vice-President BRIDGES in the Chair.

Dr. Corse made some remarks on the development of the spawn of the Frog. He exhibited specimens which he had observed to develop on the fourth day. The *Rana pipiens* passes a whole year in the tadpole state, which may account for its occasional comparative scarcity.

Dr. Uhler alluded to the supposed effect of the late severe winters in diminishing the numbers of the smaller reptiles.

Dr. Hallowell remarked that the specimen of *Proteus anguinus*, which he has had for 13 months, was still alive and healthy, although it had taken no food during that time.

July 21st.

Vice-President BRIDGES in the Chair.

Dr. Uhler, referring to the specimen of crystallized lead presented by him this evening, remarked that he had observed pigs of lead, heated in a reverberatory furnace, when near the point of fusion, become so brittle that they break with a single blow; the fragments are distinctly crystallized. Zinc, by thus heating, becomes so brittle that it may be readily powdered.

Mr. Lesley remarked, that the specimen of lead presented has the appearance of having been perfectly crystallized, and the edges of the crystals re-fused.

July 29th.

Vice-President BRIDGES in the Chair.

The Committee on Major LeConte's paper, "On three new species of Vespertilionidæ" reported in favor of publication; which report was adopted.
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On three new species of VESPERTILIONIDÆ.

BY JOHN LECONTE.

The two first species described below, were handed to me by our associate Dr. Mitchell, as coming from New Granada in Central America. The other I received from Mr. Cassin, who informed me that it was given to him as a native of Peru.

I have not been able to discover that they have ever yet been described by any naturalist, at least our very extensive library furnishes no book in which any thing like them is mentioned; therefore I do not hesitate to consider them as new. Should they prove not to be so, they are willingly and freely given up to the naturalist who has been so fortunate as to see them before me; with a regret, however, that I have been guilty of adding a synonym to that mass of rubbish accumulated by the negligence or design of others.

PHYLLOSTOMA UNICOLOR.

Upper fore teeth 2—2; the exterior ones very small, scarcely perceptible in the living animal; the two intermediate ones somewhat serrated at the base, but converging at the point so as to meet; lower four approximate, crowded, emarginate. Head large; snout elongated; nose-leaf sessile, but appearing pedicellate from the inflexion of the sides of the base, ovato-lanceolate, entire, with two perpendicular striæ, the included portion rather tumid; horse-shoe (as it is called) or addition to the base of the fore part with five blunt teeth on each side on the outer edge. Upper and under lip with a row of small warts in front. Ears ovate, blunt, with a slight exterior dilatation of the hinder part of the base, orillon triangular, more or less dentate on the outer edge. Tail none. Interfemoral membrane very narrow, very deeply and roundly emarginate, being little more than a kind of narrow membranous wing between the legs, with a small interior basal tooth, formed by the protension of the tarsal bone.

Color uniform both above and beneath, dark brown, almost black; hair fine and soft; membrane black, naked, except along the arms, where it is clothed with hair.

Inhabits New Granada.

Length 5·3 inches; head 1·35; ears ·5; orillon ·2; nose-leaf ·4; tarsal bone ·2; width of the interfemoral ·15 and ·2. Extent 11·6 inches.

PHYLLOSTOMA MINUS.

Teeth as in the former species. Head large; snout somewhat elongated. Nose-leaf sessile, triangular, entire, somewhat elongated at the point, horse-shoe entire on the edges. Ears ovate, thin, rounded on the front, straight on the hind margin; orillon oblong, with a few teeth near the base. Tail none. Interfemoral tolerably wide, deeply emarginate, with a small interior basal tooth formed by the protension of the tarsal bone.

Color above black, beneath with a slight tendency to mouse color. Membrane entirely naked, black.

Inhabits with the former.

Length 2·5 inches; head ·9; ears ·6; orillon ·2; nose-leaf ·3; tarsal bone ·3; width of the interfemoral ·45. Extent 10·8 inches.

VESPERTILIO PERUVIANUS.

Dentition the same as in *V. macrotis*.

Hair brown, above of one color, beneath tipped with greyish white. Face nakedish, black, nose bilobed. Ears ovate, broad, blunt, naked, black, much longer than the head; orillon long, knife-shaped, the inner edge convex. Membrane very thin, naked, brown; interfemoral including the tail, except the two last joints.

[July,

Length 2·6 inches; tail 1·8; naked part ·1. Extent 11 inches. Head ·85; ears 1·3; orillon ·5.

Inhabits Peru. Resembles very much the North American long-eared bat, is easily distinguished, however, by the absence of the tubercles on the face. It would be called by some *Plecotus*, but I do not admit of any such genus.

I have to ask indulgence for introducing into the above descriptions some characters which are not specific, but strictly generic. But the arrangement of the *Vespertilionidæ* is by no means such as can be admitted by any considerate naturalist, it therefore became necessary to include these generic characteristics in the two first species, as no determinate generic description of the genus *Phyllostoma* has yet been given.

August 11th.

Vice-President BRIDGES in the Chair.

A paper was presented for publication in the Proceedings, entitled "Descriptions of some new Reptiles, collected by the U. S. Exploring Expedition, under command of Capt. Charles Wilkes, U. S. N., 3d Part, by Charles Girard;" which was referred to a committee.

August 18th.

Dr. LEIDY in the Chair.

A paper was presented, entitled "Rectification of the references of certain of the extinct mammalian genera of Nebraska, by J. Leidy, M. D.;" which was referred as usual.

August 25th.

Vice-President BRIDGES in the Chair.

Dr. Leidy announced the decease of Prince Charles Lucien Bonaparte, and of Mr. H. J. Pratten, of New Harmony, Correspondents of the Academy.

The Committee on Dr. Leidy's paper presented at the last meeting, reported in favor of its publication.

Rectification of the references of certain of the extinct Mammalian genera of Nebraska.

BY JOSEPH LEIDY, M. D.

ELOTHERIUM, Pomel, 1847.

Entelodon, Aymard, 1848; *Archæotherium*, Leidy, 1850.

1. ELOTHERIUM MORTONI.

Archæotherium Mortoni; *Elotherium Mortoni*, Leidy: Proc. A. N. S. ix. 89.

2. ELOTHERIUM INGENS.

Entelodon ingens, Leidy: Ib. viii. 164; ix. 89.

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CHALICOMYS, Kaup, 1832.

Aulacodus, *Chelodus*, Kaup, 1832: *Steneofiber*, *Steneotherium*, St. Hil. 1833; *Castor*, Lin.: Kaup, Gervaise.

1. CHALICOMYS NEBRASCENSIS.

Steneofiber nebrascensis, Leidy: Pr. A. N. S. viii. 89; ix. 89.

DREPANODON, Nesti, 1826.

Megantereon, Croiz, 1828; *Agnotherium*, *Machairodus*, Kaup, 1833; *Steneodon*, Croiz, 1833; *Smilodon*, Lund, 1841; *Ursus*, L., *Felis*, L.: Cuv., Croiz, Brav., Blainv., &c.

1. DREPANODON PRIMAÆVUS.

Machairodus primaevus, Leidy and Owen: Anc. Fauna of Nebraska, 95; Pr. A. N. S. ix. 90.

DORCATHERIUM, Kaup, 1833.

Leptomeryx, Leidy.

1. DORCATHERIUM EVANSI.

Leptomeryx Evansi, Leidy: Proc. A. N. S. vi. 394; ix. 89. *Leptomeryx* is perhaps at most only subgenerically distinct from *Dorcatherium*. Some fragments of jaws with teeth, obtained by Dr. F. V. Hayden, prove that the large tubercle, which is described as rising out of the base internally of the upper true molars, in a specimen of the skull of the same animal, is an inconstant character, and independent of this, the molar teeth of *Leptomeryx* and *Dorcatherium* are identical in form.

September 1st, 1857.

Vice-President BRIDGES in the Chair.

Dr. Leidy remarked that there appeared to exist a general misconception in regard to the dentition of the *Mososaurus*. The animal is almost universally called an acrodont reptile, or one in which the teeth are inserted upon, or are co-ossified with, the border of the jaws. A number of specimens of teeth and fragments of jaws, in the museum of the Academy, prove this appellation to be incorrect.

The teeth of *Mososaurus* have a recurved pyramidal crown, and a more massive, vertically oblong root, which is often twice the length of the crown. The root is inserted for three-fourths of its extent into a correspondingly deep socket, with the sides of which it is co-ossified. The centre of the teeth is occupied by a fusiform pulp cavity, communicating with one or more vascular canals passing through the fang.

In the reproduction of the teeth, it appears the new ones commence to be developed attached to the gum, on the postero-internal side of the alveoli. As they proceed, they penetrate into the latter, by exciting an absorption of the substance of the fang of the old teeth in a direction obliquely outward and forward. The cavity for the new tooth increases in size at the expense of the substance of the fang of the old one. The pulp cavity of the old tooth, in consequence of the ossification of its pulp, appears to recede before the increasing cavity of the new tooth. The latter cavity finally makes a communication with the former, though this appears not always to be the case; and subsequently the fang of the old tooth becomes so completely excavated as to form a mere capsule, from which its crown is broken away, or shed, through comparatively little violence. In the further progress of the newly protruding tooth, the osseous capsule formed from the fang of the old tooth is gradually obliterated, except a portion which remains as a partition from the next alveolus.

[September,

Dr. Leidy stated that a few evenings since, in the yard attached to his residence, he for the first time had the opportunity of observing the male Tree-cricket, *Oecanthus*, while chirping. The sound, as is well known, is produced by the insect elevating its wings and vibrating them laterally; by which movement the edge of one wing-cover is rubbed upon a rasp or crepitaculum of the other. The sound is like that of the Field-cricket, *Acheta*, instead of a peculiar one as Dr. L. had supposed it to be. The note he had formerly attributed to the Tree-cricket, and with which the woods are vocal during the nights of this season of the year, is one resembling that produced by the quick and repeated snapping of the end of a quill pen or tooth-pick during a second or two of time. Upon examination Dr. L. found this sound to proceed from the male Katy-did, *Platyphylum*; and the mechanism producing it is similar to the stridulating apparatus of the crickets, *Acheta*, *Oecanthus*.

In the male Katy-did, the crepitaculum, situated on the under surface of the dorsal portion of the wing covers, consists of a transverse, fusiform, concave ridge, provided with about fifty serratures; and is best developed in the left wing cover. The instrument which rubs against this crepitaculum is the sharp, elevated, inner edge of the dorsal portion of the wing covers, at the side of what might be considered a trilateral tambourine, which is best developed in the right wing cover. The song (if the term may be used) of the male Katy-did ordinarily is produced by the sharp edge on the inner side of the tambourine of the right wing cover, rubbing against the rasp or crepitaculum of the left wing cover.

Dr. L. continued, he had always supposed the male Katy-did produced the familiar sound after which the insect is named, and that the female was silent. This he believed was the generally received opinion; and Dr. Thad. Wm. Harris (*Insects Injurious to Vegetation*, page 138), remarks that at night "the joyous males begin the tell-tale call." Dr. L. added, after further investigation he was happy to be able to clear the male from the libellous imputation, and that, as was usually the case among our own race, the accusation, recrimination, and denial, of katy-did, katy-didn't, came from the female herself. The apparatus by which the female Katy-did tells her tale is totally different from that of the male, though situated as in this, in the dorsal portion of the wing covers. In the dorsal portion of the right wing cover between the marginal vein, and another about half a line from it, there are about five strong transverse veins and some smaller ones, provided upon their upper surface each with a row of strong spines bent back at right angles. All other portions of the right and the whole of the left wing cover are destitute of such spines. In the left wing cover, the corresponding position to that just described is occupied by a fine rete of veins as elsewhere; and it is the inner edge of this wing cover rubbing against the hooks of the right one, which produces the tell-tale sound of katy-did, katy-didn't.

September 1st, 1857.

Vice President BRIDGES in the Chair.

Dr. J. A. Meigs read part of a letter from Mr. J. Judson Barclay, dated Philadelphia, Aug. 21, 1857, accompanying the flattened skull presented by him this evening.

"On referring to my journal, (kept during several years residence in Jerusalem,) I find a brief mention of the circumstances attending the discovery of the very singular skull now in your possession, though I fear it will afford but little aid in assigning any other place of habitation to this unfortunate adventurer, than the subterranean *locum tenens* of his bones.

The immense quarry-cave, in which this skeleton was found, it was our good fortune to discover in 1853, and by the connivance of one of the chief dignitaries of the city, we eluded the vigilance of the Turkish authorities, and succeeded in making a thorough exploration of this hitherto unknown cavern. The skeleton of this adventurous explorer (if such he may be styled) was found in the extreme South end of the cave, 100 feet from the entrance, in a deep pit. The bones (of almost giant proportions) gave evidence of having laid in that position for many years, judging from their decayed state, which, however, is not so apparent upon the skull.

How long since he ended his career, though matter of some uncertainty, is obviously no short time, for it is evident that the bats and owls have fluttered over his bones for many long centuries; for the entrance to this large quarry-cave is in the wall of the city, which undoubtedly has been kept carefully closed ever since the subversion of the Frank kingdom of the Holy Land, when the city walls underwent their last reparation.

The position of this cave, a little elevated above the area of the temple, enabled us to solve an enigma which has heretofore been regarded as an '*opprobrium antiquorum*,'—the location of those Cyclopean stones, in their great height in the outer temple wall.

What may be his history, is a still greater matter of uncertainty. We can only conjecture that he was a pilgrim, who, on exploring the labyrinthine halls of this vast grotto, stumbled down into this deep pit, but whether Jew, Christian or Moslem, is altogether matter of query."

September 8th, 1857.

Vice-President BRIDGES in the Chair.

The following extract of a letter from Dr. D. B. McCartee, of Ningpo, China, dated New York, Sept. 3d, 1857, was read :

"I forward a specimen of the 'insect wax' of China. This was said by the naturalists attached to Sir George Staunton's embassy to be the product of the larva of the *Cicada limbata*, and that 'the fly' which 'was observed by Staunton on the coast of Cochin China has curious pectinated appendages on the back, and the whole insect is covered with a white powder, which is imparted to the stems of the plants it inhabits.' This is not the case with the wax of which a specimen is sent. It is the product of a very small insect, a species of *Coccus*, as far as I could make it out. It is deposited near Ningpo on the twigs and smaller branches of a species of *ash*, in granules, giving the twig the appearance of white coral. It is not generally known that it is to be found in the vicinity of Ningpo; and it was only after a search of two years that I succeeded in finding it. * * * * I think Sir George Staunton was deceived by the fact that the larva of a species of *Cicada* corresponding to his description is found upon the same tree, as I myself saw."

Dr. Morris remarked that among the fishes brought from Panama by Dr. Ruschenberger, were found the following Atlantic species which were not previously known to exist in the Pacific: *Exocetus acutus*, *Pristipoma rodo*, *Ephippus faber*.

[September,

Dr. Meigs read the following extract of a letter from Dr. E. A. Abaddie, U. S. N., accompanying the donation of skulls presented by him.

Nos. 1 and 2 are crania taken from the ruins of Gran Quivira ; they were brought in by an expedition under the command of Major Carleton, who explored the ruins thoroughly, and presented me No. 1 skull.

No. 3. Was disinterred by myself, and found in the centre of the ruins of the church at Guarra, N. M.

No. 4. Is the skull of Jose Largo, a Mescalero chief, who was killed in a foray near Bosque Redondo, near the Pecos River, N. Mexico.

No. 5. Is the head of a Pueblo Indian, taken from the churchyard of their village Laguna.

No. 6. This skull was found with many other human remains, in a very bad state of preservation, in making excavations in an old field, in Santa Fé, N. Mexico. This head, and the remains found, evidently belonged to the same race of Indians which formed the numerous population of the large towns long since in ruins, and of which so little is known ; as Gran Quivira, Abo, Guarra Pecos, old Church, &c.

September 29th, 1857.

Vice-President BRIDGES in the Chair.

The Committee to whom the following papers were referred reported in favor of publication in the Proceedings, viz :

Observations on the Wild Turkey, by John LeConte.

Descriptions of some new Reptiles, collected by the U. S. Exploring Expedition under the command of Capt. Chas. Wilkes, U. S. N., by Charles Girard.

Observations on the Wild Turkey, or *GALLOPAVO SYLVESTRIS*, of Ray.

BY JOHN LECONTE.

Whoever has compared the Wild Turkey of the United States with the domestic animal of the same genus, must have observed that there existed very striking differences between them. These differences do not consist of slight and unimportant particularities, but in radical disagreements, which ought to remain unchangeable under all circumstances, and which form good specific characteristics.

In the tame bird, the colors vary infinitely, and in the wild one, very considerably. The great mark of distinction is in the enormous palmar or dewlap of the former, which extends from the base of the lower mandible to the large caruncles on the lower part of the neck. Whatever alterations may have been produced by long domestication, this palmar could not have been formed by an enlargement of the rather loose skin of the neck. It is a specific character, which as in our own bird is not found in the *Meleagris ocellata* of Honduras. It has been observed by my son in a former number of our Proceedings, that all derivative variations are monstrosities, and take place chiefly in those parts, which in a normal state of existence, are impossible in the genus, as we observe in hornless beeves and tailless cats, in feather-crested fowls and solid-footed swine.

The conviction that these two birds were really distinct species has long existed in my mind : more than fifty years ago, when I first saw a Wild Turkey, I 1857.]

was led to conclude that one never could have been produced from the other. I have mentioned this to many ornithologists, but no one would take the trouble to investigate the matter. At length Mr. Gould, one of the best ornithologists of Europe, in the 304th number of the Proceedings of the Zoological Society of England, has made the discovery, that there have been two species confounded together under the name of *Meleagris gallopavo*. He calls his species *M. mexicana* having received it from Mexico. I cannot determine from his description, whether it is different from ours, or is the original of the domestic bird. Mr. Gould confines himself entirely to a description of its colors, a very imperfect method of discriminating species. He mentions nothing of the existence or non-existence of the plear, nor of the frontal caruncle so long and extensible in the one, so short in the other. I am however inclined to believe, that his species differs in no manner from our native species. He quotes Brisson as describing his bird, (*Brisson, Synopsis Methodica Avium*, Vol. 1, p. 158,) and states that Linnæus's description of *M. gallopavo* is founded on Brisson's *Gallopavo sylvestris* and Ray's New England Wild Turkey (*Synopsis Avium et Piscium*, page 51, No. 3). Brisson describes and figures the domestic animal: to prove this more fully I quote his words. He says "palea longa sub gutture pendula. Une membrane charnue longitudinale pendante sous la gorge."

He mentions afterwards among the Varieties, le Dindon sauvage or Gallopavo sylvestris Novæ Angliæ of Ray. I omit any description of these two birds. Sufficiently detailed accounts of them have already been published, and shall merely observe that the Wild Turkey has been very minutely described by the Prince of Canino in his American Ornithology.

It may not be amiss to add here some observations on the introduction of the Turkey into Europe. It appears that the earliest visitors to the tropical regions of America observed the Turkey both wild and in a state of domestication. The natives therefore had been able to tame them; their transportation to foreign countries was thus rendered easy. In about thirty years after the first landing of Columbus in America they are mentioned as birds newly introduced into Europe. The province of Yucatan is particularly mentioned as the place where they were first observed, but I cannot find them mentioned as being cultivated in Spain previous to the year 1520. This may in some measure be owing to the want of Spanish publications of that early date, or at least of translations into the English language of any that may have appeared. We copy the English in thinking that the Spanish have no literature worth noticing: whereas three centuries ago they were far beyond other European nations in literature as well as in all the arts and sciences which adorn or benefit a state of civilization. If we could obtain all that was written and published in those days relative to this portion of the globe, much of the absurd and false relations of modern historians would be treated with the neglect they well deserve. It is a remarkable circumstance in the history of Europe, that the era of the introduction of many important articles of domestic use even in more modern times, is entirely unknown. No one has ever thought it worth while to record the date of the introduction of the Turkey, of Tobacco or of the Potato, into the other continent from the foreign countries where they were first found. In the case of the latter vegetable which has done so much good in the world, and has in fact altered the dietetic habits of whole nations, no one has been able to discover whence it came, or by whom it was first introduced to the notice of civilized men. I scarcely notice the story of its having been brought by Sir Walter Raleigh from North Carolina, as it could not grow naturally in that country, and he never sat foot on the soil of North America.

The peculiar habits of an animal which strongly resembles another, are frequently sufficient when joined to even slight corporeal characters to distinguish it from others. I have before observed that the Turkey was found domesticated among the nations of Central America. Now the bird which we have native among us never has been domesticated. All attempts to conquer its peculiar

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abits have failed, notwithstanding what has been said and written to the contrary. I defy any one to show a Turkey, even of the first generation, produced from a pair hatched from the eggs of a wild hen. We have every year in our markets offered for sale, birds of a very dark color, and in some degree resembling the wild species: but in every instance by the presence of the palear, the position can be detected at first sight and the cheat exposed. I have known the eggs found in the woods hatched by a domestic hen, the chickens brought up carefully, and rendered so tame and familiar as to eat out of the hand, and to shew considerable pleasure whenever persons with whom they were acquainted approached them. Yet they never would associate with the domestic turkies, studiously avoiding their company, and in little more than a year running off to the woods, and never again returning to the haunts of their infancy. I know that I shall be contradicted in this statement, and many quotations from authors brought forward against me. I repeat, contrary to the assertions of many others, that no one has ever succeeded in domesticating our Wild Turkey; speak not only from my own personal observations, but from the undivided testimony of many southern gentlemen. The Turkey of our own poultry yards, which when young is difficult to bring forward, it was thought might be obtained of a hardier race, by a new domestication; but every attempt has failed, or can I find a single well-authenticated case of a mixed breed being obtained.

Descriptions of some new Reptiles, collected by the U. S. Exploring Expedition, under the command of Capt. Charles Wilkes, U. S. N.

THIRD PART.—Including the species of Ophidians, exotic to North America.

BY CHARLES GIRARD, M. D.

In the "Fauna Peruana" we find described, a species of worm-snake, *Scolecophides*, which, having teeth upon its lower jaw instead of the upper, belongs to the same group with *Catodon* and *Stenostoma*, and since it differs generically from both the genera just mentioned, we propose the new genus

SABRINA,

with the following diagnosis: Head depressed, subovoid. Rostral plate extending under the snout. One nasal and one frontonasal: nostril between them. Preocular or postnasal. A frontal. A postoculo-labial. A parietal and a post-parietal.

SABRINA TESSELLATA.—*Typhlops tessellatum*, TSCH. Faun. Peruan. Herp. 1845-46. Locality.—Coast of Peru.

To the family of *Calamariidæ* we add the following species thus characterised:

RABDION OCCIPITALE.—Head very much depressed; eye large. Dorsal scales disposed upon fifteen longitudinal series. Ground color yellowish; scales margined with brown; beneath unicolor. Head and neck black with an occipital yellow spot.

Locality.—New Holland.

There is likewise a tree-snake, or *Dendrophid*, which is believed to be undescribed, and which we record under the name of

DENDROPHIS PRASINUS.—Its dorsal scales are very much emarginated posteriorly, and disposed upon thirteen longitudinal series. The preanal scutella is divided. Color uniformly green with a whitish line along the abdominal edge.

Locality.—New Holland.

Amongst the true *Colubrinæ* we met with a new generic type somewhat related to *Rhinechis* and *Pituophis*, being characterised as follows:

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CALLIRHINUS.

Head and body colubriiform. Snout subconical, protruding beyond the lower jaws. Vertex plate elongated. Rostral convex. Two nasal plates with nostril between them. Two loreal plates. One anteorbital and two postorbitals. Third and fourth upper labials entering into the orbit. Scales moderate, smooth. Preanal scutella divided. Subcaudal scutellæ disposed upon a double series.

CALLIRHINUS PATAGONIENSIS,—is the only species that has, so far, come to our knowledge. The scales are disposed upon nineteen longitudinal series. The ground color is olivaceous, maculated with black.

Locality.—Coast of Patagonia.

Another genus of non-venomous serpents,

CANTORIA,

is framed upon the following characters: Body subcylindrical, deeper than broad, and very much elongated. Tail moderate, thick upon its base and conical posteriorly. Head depressed, continuous with the body. Mouth moderate. Eye very small. An odd, narrow, prefrontal plate. Nasal plate unique (one right and one left), situated upon the upper surface of the head. One loreal. Orbital plates constituting a complete circle around the eye. Scales moderate, smooth, shining; disposed upon nineteen longitudinal series. Preanal scutella divided. Subcaudal scutellæ disposed upon a double series.

The typical species of this genus is *Coronella violacea*, CANTOR, Journ. Asiat. Soc. xvii. 1847, provided our determination be correct.

Locality.—A specimen of the above species was procured at Singapore.

Next in order is a species closely allied to its congeners, and which we propose thus to characterise:

XENODON ANCORUS.—Two anteorbital and two postorbital plates. Dorsal scales smooth, disposed upon seventeen longitudinal series. Brownish red above, with transverse blotches along the back and an anchor-shaped spot upon the head. Beneath unicolor.

Finally, we institute amongst venomous serpents, the genus

DOLIOPHIS,

which may be recognised by a sub-cylindrical and very much elongated body; the tail being moderate. The head depressed, though continuous with the body. Mouth moderate, provided anteriorly with two fangs on either side. Cephalic plates normal. Two nasals, with nostrils between them. No loreal plate. One anteorbital. Third and fourth labials entering into the orbit. Two postorbitals. Scales smooth, shining, disposed upon thirteen longitudinal series. Preanal scutella entire. Subcaudal scutellæ disposed upon a double series.

DOLIOPHIS FLAVICEPS.—*Elaps flaviceps*, CANTOR, Journ. Asiat. Soc. xvii. 1847, is the only species so far known to us as belonging to this genus.

Locality.—Singapore.

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October 6th, 1857.

DR. RUSCHENBERGER in the Chair.

A paper was presented for publication in the Proceedings, entitled "Notes on American Land Shells, No. 2, by W. G. Binney;" which was referred to a Committee.

On motion of Dr. Leidy, it was unanimously resolved that a special vote of thanks be tendered to Dr. W. A. Hammond, U. S. A., for his valuable donations to the Museum of the Academy.

October 27th, 1857.

Vice President BRIDGES in the Chair.

The Committee on Mr. Binney's paper, presented Oct. 6th, reported in favor of publication.

Notes on American Land Shells. No. 2.

BY W. G. BINNEY.

HELIX (POLYGYRA) ACUTE-DENTATA. Testa superne et subtus parum planata discoidea, albida, glabra; anfractus 6 lævigati, quorum quinque æqualiter accrescentes, apicem brevissimam, vix elevatam formantes; ultimus permagnus, inflatus, prope peristomata bis valde scrobiculatus, ad aperturam deflectus; subtus anfractus 1½, ultimus ventricosus, alter rapide decrescens; umbilicus parvus, profundus; sutura impressa; apertura parva, perobliqua, ringens; peristoma circulare, acutum, album, incrassatum, patulo-reflexum, marginibus callo albo, dentiformi, emarginato excavato conjunctis, dextro dentibus duobus horizontalibus, uno obtuso, alteri acutissimo intus armato, basali dente unico perpendiculari in margine posito, munito.

Diam. maj. 14, min. 11, alt. 4 mill.

Specimen unicum in collectione Phillips conservatum in provincia Mexicana Cinaloa ripis fluminis Mazatlan collegit Gambel.

This curious *Helix* differs from any hitherto known. It is readily distinguished by a white, shining discoidal shell, curious aperture and internal teeth. The upper surface is composed of six whorls, five of which regularly increase from the spire, which is slightly elevated; the last is proportionally very wide, inflated, and elevated above the others, almost to a level with the apex. Below, one full ventricose whorl is visible, and more than half of another, which rapidly decreases until it becomes lost in the small umbilicus. The aperture is oblique, basin-shaped, furnished with four teeth; of these one on the parietal wall connecting the extremities of the peristome is broad, excavated in the middle, angular, resembling that of *H. Troostiana*, Lea, (plicata, Say); on the basal portion of the peristome is another, situated on the edge, perpendicular and short; on the right lip, slightly removed within the aperture, are two slight elongated laminae, running horizontally, the lower one raised above the whorl for some distance, thus forming a slender, spear-like point. Behind the teeth on the outer whorl are two pits, between which the shell is pinched into a sharp ridge joining the peristome.

HELIX (POLYGYRA) LOISA. Testa albido-cornea, tenuis, supernè minutè et confertim striata, spira paululum elevata, sutura impressa, anfr. quinque, vix convexiusculi, ultimus permagnus; subtus inflata, nitida, vix perforata, anfr. 1½, ultimus ventricosus, prope peristoma bis valde scrobiculatus; alter rapidissimè decrescens, apertura ringens, quinquedentata; perist. acutum, album, incrassatum, patulo-reflexiusculum, marginibus callo albo, crasso, dentiformi, 1857.]

paululum intrante, angulato conjunctis, dextro lamine duobus horizontalibus, curtis, intus positis munito; basali dentibus duobus perpendicularibus in margine positis, uno parvulo, altero majore, munito.

Diam. maj. 13, min. 11, alt. 5 mill.

In Provinciâ Mexicanâ Cinaloâ ad flumen Mazatlan collegit Gambel. Collect. Phillips.

Var. minor diam. maj. 10, min. 7, alt. 3. In Texas habitare dicitur. Collec. Mea.

Shell above depressed, shining, with hardly perceptible striæ, whitish, suture slightly impressed, whorls five, rather convex, last whorl rather proportionally larger, with two pits behind the peristome, and channelled; spire slightly elevated; below smooth and shining, one full ventricose whorl and a portion of a second, which rapidly decreases in the slightly perforated umbilicus; aperture basin-shaped, much complicated by five teeth; one on the parietal wall is white, heavy, angular, somewhat like that of *H. Texasiana*, connecting the two extremities of the sharp and reflected peristome. On the edge of the peristome near the columella are two short, stout, perpendicular teeth, the nearer one the shorter; within the aperture are two short, slender, tooth-like, horizontal laminæ, entering but a short distance; umbilicus nearly closed; peristome white, thickened, slightly reflected.

Nearest allied to *H. ariadne*, Pf., (*Couchiana*, Lea, Proc. Acad. N. S., anno 1857, April, p. 102.) I have compared it to Mr. Lea's type, and find it to be quite distinct. The latter is not perforated and has a very different arrangement of teeth. That *H. Loisa* is not a less developed specimen of *H. Couchiana* is shown by the fact of its being twice the size. Mr. Lea's shell has the parietal tooth more angular, flexuose, and entering farther into the aperture; the teeth on the right lip are not horizontal, heavier and longer, and extend to the edge of the peristome, where they are very solid and elevated, while in *Loisa* they are slender laminæ, removed within the aperture.

HELIX (POLYGRA) MOOREANA. Testa orbiculato-depressa, carinata, umbilicata, albida; spira obtusa, plus minusve elevata; anfr. 6, vix convexiusculi, striati, ultimus infra carinam non rotundatus; sutura impressa; subtus striæ minus distinctæ; anfr. 1½, ultimus carinâ valde productâ anfr. alterum et umbilicum profundum pene tegens; apertura orbicularis, contracta, tridentata; perist. album, incrassatum, vix reflexiusculum, margine basali dentibus duobus curvatis marginalibus sinu parvulo orbiculari separatis, armato; plica alba rectangularis, dentiformis, excavata, in medio aperturæ projecta ad columellam adnata, et perist. margines connectans.

Diam. maj. 8½, min. 7, alt. 3 mill.

Hab. Washington Co., Texas. Fr. Moore!

Shell orbicular, depressed, white, carinated, umbilicated; spire more or less depressed, obtusely rounded; whorls 6, distinctly striated, hardly convex; suture impressed; below the carina the body whorl is not rounded, but slants down to the base which is parallel with the suture; below, the striæ are less distinct; at the umbilical region only 1½ whorl is visible, the outer one strongly carinated so as to conceal a portion of the umbilicus and a great part of the remaining whorl; the umbilicus is very small, but perforates the shell to the apex, showing all the volutions with the aid of a lens; aperture rounded, contracted by three teeth; lip heavy, broad, white, hardly reflected, near the basal extremity, quite on the edge, armed with two short, incurving teeth, separated by a small rounded sinus; on the columella there is a tooth-like fold, square, projecting across the aperture, its extremities joining those of the peristome.

It is difficult to express correctly in words the specific differences of the various Polygyræ. This shell combines the characteristics of several American species. It has the spire of *H. monodon*, Rackett, and the columellar fold of *Dorfeuilleana*, Lea, as figured Tr. Am. Phil. Soc. vi., pl. xxiv., f. 118. The teeth are placed on the inner edge of the peristome, as in *Texasiana*, Mor., and the curious carination at the umbilical region resembles that of *pustula*, Fer.,

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which has not been noticed in descriptions. In the collection of the Academy.

HELIX CULTELLATUS, Thomson, MSS. Testa orbiculato-depressa, nitens, carinata, corneo-rufescens, ad peripheriam et ad suturas albo-zonata; anfr. 6½ convexiusculi, striis minutis incrementalibus et lineis microscopicis spiralibus decussati; sutura impressa, apertura oblique lunaris; perist. simplex, acutum, ad columellam vix reflexiusculum; subtus lævigata, albida, infra carinam latè rufo-corneo-zonata; umbilicus perspectivus, anfr. omnes ad apicem monstrans. Diam. maj. 35, min. 19, alt. 13 mill.

Habitat. "Contra Costa Co., California." J. H. Thomson.

Animal twice the length of the diameter of the shell; color reddish.

Mr. J. H. Thompson, of New Bedford, Mass., proposes this name for a shell found by him living in considerable quantities. The circumstances in which it was discovered are very unfavorable to the supposition of its having been brought from abroad. The chances of a Dalmatian shell having been introduced into California, and already multiplying there, are very small indeed. At the same time the shell before me bears strong resemblance to the European group of this type. It seems to be between *H. albanica*, Ziegler, and *acies*, Partsch; the carina being less sharp than in the latter. Mr. Thomson suggests that it may have been imported from the Sandwich Islands on vegetables, but there is no species native to that region which bear any resemblance to this.

HELIX ANACHORETA. T. orbiculato-convexa, apertè umbilicata, cinereo-rufescens, granulata et rarè indenta; spira elevata, conica; anfr. 6 convexi, ultimus subtus ventricosus; sutura impressa; perist. incrassatum, vix reflexiusculum, violaceo-albidum, umbilicum haud multum occultans, marginibus approximatis, callo conjunctis; faux violacea; apertura obliqua, transverso-rotundata. Diam. maj. 26; min. 21; alt. 14 mill.

Habitat omnium Californian. J. H. Thomson.

Shell reddish ashen, orbicularly convex; spire elevated, conic; umbilicus open, slightly concealed by the peristome; whorls six, granulated and sparsely indented; suture impressed; below ventricose; aperture transversely rounded; peristome thickened, scarcely reflected, whitish, with a violet tinge, the extremities approaching each other and connected with a callous on the parietal wall; throat violet.

"Animal light ashen color, tentacles nearly white; average length of some thirty specimens 2½ inches (2 diameters of shell); superior tentacles 5-8ths; inferior 3-16ths inch; foot broad at the posterior extremity; a line of large granules down the middle of the back; sides of foot margined with a line of light granules (pores); genital orifice posterior to and beneath the larger tentacles. In its habits solitary." Thomson.

It with some hesitation that I propose a name for this shell. I at first considered it as a bandless variety of *Californiensis*, Lea. But on expressing this opinion to Mr. Thompson, he gave me the above description of the animal and its habits, which are quite distinct from those of Mr. Lea's shell. Its characteristics were found constant at various remote points of the State, and in a considerable number of specimens. They seem too great for a simple variety. The animal is also different in its habits from *Californiensis*, being found only solitary, while the latter is gregarious.

The shell is one of the very few bandless species of California.

HELIX ÆRUGINOSA, Gould. (Proc. Boston Soc. N. H., Feb., 1855, p. 137.) Nomen transmutandum est ob. *H. æruginosam*, Pf. (Pro. Zool. Soc., London, 1854.) This name being preoccupied for a Philippine Island shell, Dr. Gould proposes to call it *H. ARROSA*. "Inhabits only Redwoods." (Thompson.) It seems a very variable shell. The type resembles in shape *H. Townsendiana*, Lea. Among the land shells collected in California by Dr. J. S. Newberry, P. R. R. Survey, was one which I called var. β of Dr. Gould's shell. It has a very elevated, conical spire, like *elevata*, Say, but agrees in other respects with the 1857.]

type. The Californian land shells seem very difficult to understand on account of their variation. Although this shell bears little resemblance to *Californiensis*, Lea, as fig. in Tr. Am. Ph. Soc., vi., pl. xxiii., f. 19, there is a gradual blending of the two. For some of the links in the connecting chain, see the fig. Terr. Moll. iii, vi. a, Reeve, Con. Icon. 661, and Chemn. Ed. 2, pl. lvii. fig. 14, 15. The last resembles *arrosa*, var. β very much. This connecting chain of resemblance is also carried by specimens in my cabinet to *Dupetithuarsi*, Desh. Future research will alone enable us to draw the correct divisions of the species.

HELIX (POLYGYRA) THOLUS. Testa solidiuscula, albida, nitens, costis obliquis notata; spira rotundata, elevatiuscula, obtusa, tholiformis; sutura valde impressa, anfr. 7, convexiusculi, superi magis planulati, ultimus ad aperturam descendens, obtusè carinatus, carina peristoma non attingens, post perist. canaliculatus; infra carinam costæ minus distinctæ; basis plana, umbilicus latus, perspectivus, anfractus canaliculatos monstrans, quorum 2 $\frac{1}{2}$ perspicuè alii obscurè videntur; apertura perobliqua, ab axe remota; perist. album, semicirculare, latum, incrassatum, margine basali reflexiusculo, dentibus duobus sinu rotundato disjunctis armatum; plica parietalis acuta, in medio aperturæ projecta, margines peristomatis vix connectens. Diam. maj. 11; min. 9; alt. 4 mill.

Habitare in Texas suspicor, sed incertus sum. Specimen unicum vidi in coll. Bland conservatum.

Shell rather solid, white, shining, ribbed above, smoother below; spire obtuse, little elevated, rounded; whorls seven, convex, the upper ones more flattened, the last bluntly carinated; carina not reaching the peristome; base parallel to the suture; umbilicus broad, half the larger diameter of the shell, showing two and a half deeply grooved whorls plainly, the others rapidly retreating towards the apex; aperture very oblique, semicircular, removed from the axis of the shell, bordered with a scarcely reflected, white, heavy rim, grooved behind, and armed with two stout teeth near the basal extremity, broadly reflected at the junction with the body whorl; on the parietal wall of the aperture is a white fold, hardly connecting the extremities of the lip, and projecting across the aperture into an acute point.

The aperture of this curious shell resembles that of *H. fulgiata*, Say. It is readily distinguished from that and all other described species by the umbilicus, broad at the commencement, and rapidly narrowing beyond the second whorl, with the peculiar groove visible in all the whorls of the umbilicus, of the same character as that noticed by Say in *auriculata*, though deeper.

The name is derived from the resemblance of the slightly raised, rounded spire to a low dome.

HELIX KOPNODIS. Testa depresso-globosa, corrugata, subtus lævigata; spira brevis, depressa; sutura mediocris; anfr. quinque, rapidè accrescentes, ultimus permagnus, ventricosus, interdum lineis volventibus crassiss notata; apertura magna, rotundata; perist. simplex, acutum, marginibus approximatis, callo levi, brunneo conjunctis; ad umbilicum parvum et profundum reflexiusculum. Diam. maj. 35; min. 28; alt. 13 mill.

Habitat in Alabama, (C. S. Hale!)

Forsan forma monstruosa *H. fuliginosa*, Binney, sed differt speciminibus meridionalibus colore, testâ majori, solidiori, magis globosâ; umbilico angustiori; aperturâ majori, magis rotundatâ, spira magis elevata; et lineis volventibus. Varietates alligantes non exstant.

Figura Reeveana, Con. Icon. No. 672. Etsi minus globosa, affinis paritur sed minutè costellato-striata dicitur.

Shell depressed-globose, wrinkled, below smooth; spire short, depressed; suture moderate; whorls five, rapidly increasing, the last very ventricose and large, sometimes marked with coarse revolving lines; aperture large, round, lip simple, acute, ends approached, joined by a slight deposition of brownish callus over the parietal wall, reflected at the small and deep umbilicus.

It is a much larger and more globose shell than *H. fuliginosa*, Binney, with a
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smaller umbilicus, more rounded and larger aperture, and more ventricose body whorl; its color is also lighter. The revolving lines are present in four out of six specimens before me.

Reeve's fig. Con. Icon, No. 672, has some resemblance to it in shape, though less globose—but differs in being striate above.

In the collection of the Academy.

HELIX FRIABILIS. Testa globosa, papyracea, friabilis, subdiaphana, nitens, rufescens; spira parvula, elevato-conica; anfr. quatuor, leviter corrugati, convexi, ultimus permagnus, ventricosissimus; sutura mediocris; apertura circularis, parum alta et longa, intus livida, callo levi albo sub-incrassata; perist. acutum, tenue, simplex, ad basin reflexiusculum, violaceum, umbilicum parvum et profundum aliquid tegens. Diam. maj. 26; min. 20; alt. 13 mill.

Habitat in ripis fluminis Wabash, (Mrs. Say!) In Illinois (R. Kennicott!)

Species rara, ad sectionem *H. fuliginosa*, Binney, referenda, sed testâ papyraceâ et rotundatâ, spirâ elevatâ, et aperturâ circulari distincta.

Shell very globose, transparent, brittle, thin, shining, reddish; spire very short, conic; whorls four, convex, lightly wrinkled, rapidly increasing, the last very large and ventricose; suture moderate; aperture circular, equally high and broad, within bluish and slightly thickened by a very thin white callus; perist. simple, sharp, thin, at its junction with the body whorl, violet colored and reflected, so as to cover a portion of the small and deep umbilicus; the parietal wall of the aperture is covered with a light violet colored callus.

Belongs to the same group as *H. fuliginosa*, Binney—but readily distinguished from that and all described species by its transparent, globular shell, ventricose body-whorl, and circular aperture. At the localities where it was found by Mr. Kennicott, *H. fuliginosa* was not noticed.

There is a shell received from Texas, by Dr. Newcomb, which may prove to be identical with this.

In the collection of the Academy.

HELIX REDIMITA. Testa globoso-conica imperforata, tenuiscula, minutè et confertim granulata, corrugata, rufo-brunnea; apex lævigata, obtusula, spira elevata; anfr. 6 convexi, suturâ impressâ distincti, ultimus permagnus, inflatus, ad aperturam descendens, supra medium fasciâ fuscâ redimitus; apertura perobliqua, transverso-orbicularis, intus unifasciata; perist. simplex, rufocinereum, incrassatulum, marginibus valde approximatis, basali reflexiusculo, callo albo umbilicum tegente. Diam. maj. 21; min. 17; alt. 12 mill.

Syn. *Helix Nickliniana*, Binney, Terr. Moll. iii. pl. vi, f. 1, exceptâ iconè in medio positâ.

Habitat in California aut in Oregon?

Shell globose-conic, imperforate, rather thin, wrinkled, covered with minute and crowded granulations; color reddish brown; apex free from granules, rather blunt; spire elevated; suture impressed; whorls six, convex, the last quite large and rounded, falling towards the aperture, and banded with reddish brown above the middle; aperture rather large in proportion to the size of the shell, very oblique, transversely rounded, within showing the band; peristome simple, reddish ash color, thickened, reflected slightly at the base, ends approached; umbilicus entirely covered with a white callus.

This shell is figured by my father as a var. of *H. Nickliniana*, Lea. A reference to Mr. Lea's figure and description will at once show it to be distinct, according to the present notions of specific weight. Dr. Gould refers it (Terr. Moll. iii. p. 26) to *H. Californiensis*; Reeve, Con. Icon. 661. It appears, however, to be distinct from the shell there figured.

In general outline it resembles *H. Kellittii*, Forbes, Proc. Zool. Soc., London, 1850, pl. ix, f. 2, as well as Reeve's fig. 665 b, not 665 a, Con. Icon. The resemblance will be found, however, to cease with the outline, on a comparison of the two shells. *H. Kellittii* is sometimes perforate, is differently colored, and belongs rather to the group of California *Helices* represented by *H. arcolata*.

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Sowb. and *H. Pandora*, Forbes, than that of *H. Californiensis*, Lea, *intercisa*, nob. and the shell before me.

HELIX DUPETITHOUARSI, Desh. In the collection of the Smithsonian Institute there are specimens of this shell which are furnished with a delicate greenish yellow epidermis. As this has never been noticed in descriptions, I believe it must exist only on very fresh specimens, which are rarely seen. On being immersed some minutes in water, the epidermis becomes of a bright golden color.

HELIX LABIOSA. Gould, (by many considered identical with *Columbiana*, Lea.) To Mr. J. H. Thomson I am also indebted for the following interesting notes on this shell. It will be very important to dissect the animal, as it may prove generically distinct from *Helix*.

"Animal twice as long as the breadth of the shell, dark slate color, almost black on the head and tentacles; a black line running along each side of the back from the base of the longer tentacles; body covered with compressed granules; tentacles black, acutely pointed: *eyes at the base of superior tentacles*; anatomy believed to resemble, somewhat, that of the *Lymniadæ*. Gregarious; in its habits resembling *Lymnæa*, being found always near water, and laying its eggs on the water-cresses and other aquatic plants. Arrives at maturity in one year, one half the time required by the other species."

HELIX CALIFORNIENSIS, Lea. "Animal reddish grey, tentacles and base of foot bluish; quite narrow in proportion to the length of the shell; tentacles short. Gregarious, inhabiting dry gullies and hill sides; many specimens found in a cabbage garden." Thomson.

HELIX SPORTELLA, Gould. I am indebted to Mr. Thomson for a fine specimen of this rare species, the only one I have ever seen. His notes show the animal to be quite distinct from that of *H. concava*, Say, however similar the shells may be, with the exception of the striæ on the Californian species. He writes, "Animal uniformly white or flesh colored, with an orange line on top of back. Solitary—or only found in pairs."

HELIX LORICATA, Gould. (*Lecontii*, Lea.) This rare species also was added to my collection through the liberality of Mr. Thomson. One specimen found by him was very much larger than Dr. Gould's shell. He gives the following description of the animal: "white, linear, rough, posteriorly acute, tentacles very short."

BULIMUS DORMANI, n. s. Testa perforata, ovato-turrita, lævigata, albida, fasciis fuscis longitudinalibus ornata; sutura impressa; spira elongato-conica; acuta; apex punctulata; anfr. 6 convexiusculitis, lineis minutissimis volventibus ornati, superi striati, ultimus inflatus, ad marginem superam peristomatis, obtusissimè carinatus; apertura ovata, partem testæ dimidium subæquans; perist. simplex, acutum, margine columellari reflexiusculum, perforationem pene occultans. Diam. 12; long. 29 mill.

Habitat in peninsula Florida prope St. Augustine. O. S. Dorman!

Shell perforated, rather heavy, shining, elongated-conic; white, with several regular revolving series of interrupted perpendicular, reddish brown patches; suture distinctly marked; apex punctured; whorls 6, rather convex, marked with numerous very fine revolving lines; upper whorls striate; last whorl full, with a hardly perceptible obtuse carina at the upper extremity of the peristome.

The only described species with which this shell can be confounded is *B. Floridianus*, Pf., Proc. Zool. Soc., London, 1855, p. 330. Though I have never seen Dr. Peiffer's shell, I should consider it nearly allied, though distinct. It wants the minute revolving lines, the punctured apex, and striate upper whorls, which characterize *B. Dormani*, is a smaller shell, and has a different marking, being furnished with opaque whitish blotches as well as reddish patches; the latter also do not extend to the body whorl.

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GLANDINA CONICOLA. Testa conico-oblonga, tenuis, nitens, cornea; anfr. 7 ad 8, convexi, tenuissimè et longitudinaliter striati, et lineis minutis creberrimis notati; sutura crenulata; apertura oblonga, partem testæ dimidiam æquans; columella contorta, truncata, callo induta. Diam. 18; long. 50 mill.

Syn. *Glandina truncata*, var. Binney non Gmel. Terr. Moll. iii. pl. lxi. f. 1.

Habitat in Rebuspublicis meridianis. Florida?

Shell oblong-conic, thin, shining, horn color; whorls 7 to 8, longitudinally striate, and covered with numerous minute revolving lines; suture slightly crenulated; aperture oblong, half as long as the shell; columella curved, truncated, covered with light callus.

This shell, very rare in collections, is distinguished by its light horn color, thin shell and revolving lines.

GLANDINA PARALLELA. Testa solida, albida, nitens, cylindraceo-elongata, striis creberrimis longitudinalibus notata; spira elevato-obtusa; anfr. 5 ad 6, superi convexi, ultimus lateribus rectis, æquis intervallis inter se distantibus, apertura angusta, partem testæ 3-7 æquans; labrum flexuosum, in medio rectum, margine basali curvatum; columella recta, truncata, callo induta. Diam. 20; long. 56 mill.

Syn. *Glandina truncata*, var., Binney. Terr. Moll. iii. pl. lxii. f. 2.

Habitat in Louisiana, Rev. E. R. Beadle!

Shell heavy, shining, white, elongated, cylindrical; spire elevated, obtuse; whorls 6 to 7, with numerous, delicate, longitudinal striæ, the upper ones convex, the last one with straight parallel sides; lip straight along the middle, and parallel to the rectilinear side of the opposite whorl, at the basal extremity curved; columella straight, truncated, covered with a heavy callus.

Distinguished by its peculiar parallel sides and heavy texture from any other described species.

The following are notes on the plates contained in Vol. iii. of the Terrestrial Mollusks.

HELIX RUGELI, Shuttleworth, (Diag. neuer Moll. No. 2.) is described as always larger than *H. infecta*, Say. I have the latter of the same dimensions as given for Rugeli, 13 mill., and some specimens of Mr. Shuttleworth's shell only 8 mill.

HELIX MORDAX, Shuttleworth, is a variety of *H. alternata*, Say. I have a large series, showing a gradual change from the typical Northern Shell to the strongly ribbed and more or less carinated Southern form. *H. strongolydes*, Pfeiffer, is also a variety of the same shell. Perhaps, also, *H. infecta*, Parr.

HELIX MULTILINEATA, Say. I have a variety of this with an open umbilicus. Another, received from Mr. J. A. Lapham, of Wisconsin, is small, of an uniform brownish-red, without any revolving lines.

HELIX CLAUSA, Say. Terrestrial Mollusks, pl. iv. The outline figures do not represent this species.

H. VINCTA, Val., Terr. Moll. iii. pl. vi., is certainly distinct from *Californienensis*, Lea. (Compare his fig. and descr. T. Am. Ph. Soc. vi. pl. xxiii., f. 79.)

The centre figure of this plate is *H. intercisa*, nob. Proc. A. N. S. Phila., 1857, p. 18. Fig. 1. Upper and lower figure cannot be considered a variety of *Nickliniana*. I propose for it the name of *redimita*.

Pl. vi. a. The European conchologists now consider *H. Nickliniana* and *Californiensis* as identical, and figure this shell under the latter name.

H. DENTIFERA is not confined to Vermont. It is a mountain shell, has been found by Mr. Edwards in Virginia, Dr. S. E. Shurtleff in Western Pennsylvania, Mr. Conrad at Broad Top Mountain, and Mr. Phillips on the Lehigh.

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H. NUTTALLIANA, Lea, is universally considered as *H. fidelis*, Gray. Mr. Gray's description has the priority of several years.

H. VANCOUVERENSIS, Lea. I see no reason why *H. vellicata*, Forbes, should not be considered as a variety of this.

H. EGNA, Gould non Say, pl. xxii. a. This shell, though never seen by Mr. Say, is called by one of his names. It is certainly a disadvantage to increase the already burthensome nomenclature, but is it not worse to make one name serve for two distinct species? Mr. Say's shell was found by Mr. J. S. Phillips at the 8 mile lane above Philadelphia, and is still preserved in his collection. I think it will prove to be distinct from *chersina*, Say. The latter has a much more elevated spire, rounded at the top like *labyrinthica*, Say, and is only obtusely carinated; while in *egna*, Say, a very acute carina divides the shell into a short, pyramidal, sharp spire, and a rounded, inflated base, whose outline forms a semicircle. As I consider *H. egna* a good species, I leave it to Dr. Gould to propose another name for the Florida shell.

*HELI*X FALLAX, Say, is certainly more than a variety of *tridentata*, Say. Not only are the characteristic differences well marked, but the habits of the respective animals are different. Mr. J. G. Anthony tells me that *tridentata* is found on hill sides in the grass, while *fallax* inhabits rich soils, in woods, under logs, and is not gregarious like the former. The difficulty is to mark the dividing line between the many varieties of *fallax*, some of which are quite as distinct as *H. Hopetonensis*, Shuttl. In one specimen of *fallax* in my cabinet there is a well developed "fulcrum" as in *monodon*, *spinosa*, and others mentioned by Mr. Lea.

*HELI*X MINUTISSIMA, Lea, is certainly distinct from *H. minuscula*, Binney. Had my father been spared to finish his work, he would have withdrawn the opinion expressed in Vol. ii., p. 221. I have a note of his taken at Mr. Lea's house, in which he says they are distinct. Dr. Leidy tells me that he made a figure of Lea's type for engraving, which was subsequently lost.

*HELI*X COSTATA, Müll. Dr. F. V. Hayden collected many thousands of this ribbed variety of *pulchella*, Müll. (*minuta*, Say,) in Nebraska. It had hitherto been noticed only in Philadelphia and Cincinnati.

*HELI*X GLAPHYRA, Say, pl. xxix., f. 4. That this shell is identical with *cellaria*, Müll., was the opinion of Dr. Binney. I am able to add to the same effect the testimony of two of our first conchologists, Mr. J. G. Anthony and Dr. Griffith. The former tells me that thirty years ago he found a shell in considerable numbers in his garden, at Providence, R. I., in all respects agreeing with the European *cellaria*. On carrying it to Philadelphia, the conchologists of that time all called it *glaphyra*, Say. The testimony of Dr. Griffith is still more conclusive. I have a letter of his to my father in which he says that he *had seen* Say's type of *glaphyra* in the collection of the Academy, and that it was certainly the *cellaria* of Europe. He adds, that when arranging the collection, the shell was broken and thrown aside.

*HELI*X SAXICOLA, Binney non Pf. pl. xxix. a. f. 4, is *H. incrustata*, Poey. It agrees in all respects with the Cuban specimens in the Academy received from Mr. Poey.

*HELI*X LUCUBRATA, Binney non Say, pl. xxxii. does not represent Say's shell. Though figured by Deshayes in Fer. Hist. pl. lxxxii. f. 6, it was first described by Pfeiffer, Mong. i, p. 64. The common form is hardly as globose as the shell figured.

*HELI*X SULPLANA, Binney, has been found by Mr. J. S. Phillips on the banks of the Susquehanna, near Wyoming, Pa.

*HELI*X INTERTEXTA, Binney, pl. xxxvi. The southern form of this shell would by many be hardly considered as the same species. The spire is very much

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flattened, color much lighter, body whorl less inflated and very sharply carinated. The northern form very rarely reaches the size figured.

HELIX SEPTEMVOLVA, Say, pl. xxxviii. The middle figures come nearest to Muhlfieldt's type of *cereolus*, figured in the Berlin Magazine. The internal lamina mentioned on page 31 is found constantly in *H. microdonta*, Desh. of Florida. It is not, however, confined to that alone, (Shuttl. Diag. Neuer Moll. No. 2,) as I have detected it in a few instances in the large *cereolus* and other forms. In Florida there are several varieties of this shell as well worthy of specific distinction as *microdonta*, Desh., *volvaxis*, Parr, and *delitescens*, Shuttl. Muhlfieldt's name *cereolus* has priority, having been published in 1816, and not 1818 as quoted by Pfeiffer, &c. The European conchologists, Pfeiffer, Reeve, &c., mention as a synonym of this shell *H. polygyrata*, Binney, a name not even mentioned by him.

HELIX SUPPRESSA, Say, small var. Pl. xxxvii. fig. 3. This appears to be *bicostata*, Pf.

HELIX PLICATA, Say, pl. xxxix. f. 2. Mr. Say's type is preserved in the collection of the Academy. Having carefully compared it with Mr. Lea's original *Troostiana*, I am led to believe them identical. In this case Mr. Lea's name alone will stand, as that of Mr. Say is preoccupied. In Vol. ii. p. 195, *H. plicata* is said to be identical with *fatigiata*, Say, *Dorfeuilleana*, Lea, and *Troostiana*, Lea. I cannot agree with this opinion; *H. fatigiata* is certainly distinct from the others. (Pl. xxxix. f. 2.) The characters on which Mr. Lea's two species are founded are certainly not very distinct; at the same time their constancy gives them weight. Of twenty-five specimens found in Tennessee by the Rt. Rev. Bishop Elliott, all were well marked *H. Troostiana*.

HELIX LEPORINA, Gould, had been found only in Mississippi and Arkansas, until Mr. Postel discovered it at St. Simon's Isle, Georgia, Dr. H. M. Neisler in Butler County, of the same State, and Bishop Elliott at Savannah. Future research will probably prove it an inhabitant of the whole South.

HELIX MAXILLATA, Gould, has also been found by Dr. H. M. Neisler in Butler County, Georgia.

HELIX BUFFONIANA, Pf., pl. xliii. This seems rather the variety which Pfeiffer described formerly as distinct under the name of *Humboldtiana*; he now unites the two.

HELIX INFLECTA, Say, pl. xlv. f. 3. It is a typographical error on p. 33 to call this *H. triodonta*, Jahn.

HELIX POLYCHROA, Binney, pl. xlv. xlvii. It is hardly necessary to find another name for this shell (ob. *H. polychroa*, Sowb.) as it seems to be *varians*, Mke.

HELIX SELENINA, Gould, pl. xlviii. This is certainly *H. vortex*, Pf., of the West Indies. I do not agree with Dr. Gould, (p. 34,) in considering *H. tenuistriata*, Binney, as the same shell; a comparison of the description of the latter will show them to be distinct. The geographical distribution is also very different. Dr. Binney's shell is from Tennessee, while *vortex*, is a West Indian species, introduced only into the Southern extremity of Florida. The description on the cover, Boston Journal Nat. Hist. iv. part 1, anno 1842, is as follows. "*Helix tenuistriata*. Testa depressa, carinata, umbilicata, albido cornea; anfr. 7 oblique striatis; apertura angusta, depressa, labro subreflexo, basi convexo. Lat. $\frac{1}{2}$ poll. Hab. Tennessee." I have a shell in my cabinet to which this description applies pretty well; I am not sure, however, that it is the same. Future research will undoubtedly bring the species to light.

HELIX AURICULATA, Say, pl. xl. I do not consider fig. 2, *H. avara*, Say, as a var. of this, but a distinct species. There are some varieties of *auriculata*, which may be confounded with it, but it is certainly a good species. Among other 1857.]

distinctive characteristics it is *hirsute*, as mentioned by Say. I am indebted to Mr. James Postel, of St. Simon's Isle, Georgia, for some very fine fresh *hirsute* specimens. From Mr. O. S. Dorman of St. Augustine, Fla., I have some fine specimens of *auriculata*, 16 mill. in the greatest diameter.

HELIX ELEVATA, Say. Mr. Robert Kennicott collected in Wisconsin two specimens of a curious variety of this species, furnished with a broad, revolving, brownish band on the body whorl.

HELIX STENOTREMA, Ter. pl. xlii. f. 4, is a very well marked variety of *hirsuta*, confined to the region of Tennessee.

BULIMUS DEALBATUS, Say, pl. li. However well defined may be the distinctive characteristics of this species and *B. schiedeanus*, *lactarius*, &c., it is extremely difficult to trace the dividing line between them, when seen in large quantities. I have specimens picked from the same bush in Texas, some of which would be referred to each of these species. At the same time it seems hardly possible that the large, heavy shell figured on pl. li. *b*, should be the same species as the small, fragile shell pl. li., fig. 1. At all events, it is necessary to distinguish them by different names.

ACHATINA PELLUCIDA, Pf. pl. liii. f. 2, is *Blauneria* (*Voluta*) *heteroclitia*, Mont. Dr. E. Foreman has specimens found in his garden at Washington, whither they were brought on plants from Charleston, S. C. Mr. T. Bland found it inhabiting brackish water in Jamaica.

BULIMUS VIRGULATUS, Binney non Fer. pl. lviii., (see remarks Vol. ii. p. 279.) I concur entirely with Dr. Gould in considering this shell identical with *B. multilineatus*, Say, which name has the priority of many years of Reeve's name *venosus*. Ferussac's shell is quite distinct. Mr. Say's description of *B. multilineatus*, (Journ. Acad. N. S., Phila., Vol. 5, p. 120, anno 1825,) is as follows: "Shell conic, not very obviously wrinkled; whorls not very convex, yellowish white, with transverse, entire, reddish brown lines; a blackish subsutural revolving line; apex blackish; umbilicus small, surrounded by a broad blackish line; columella whitish, labrum simple, blackish. Length less than 7-10th inch, greatest breadth less than 7-20th inch. This species was found by Mr. Titian Peale on the southern part of East Florida."

Mr. Bartlett found the *virgulus*, Binney, in the same locality.

GLANDINA TRUNCATA, Binney non Gmel., pl. lxi. f. 1, is *G. corneola*, nob. vid. supra. Fig. 2 is *G. Texasiana*, Pf., *Novitates Conch.* p. 7, pl. xxii. f. 11, 12. Figure 2, pl. lxii. is *G. parallela*, nob. vid. supra.

HELICINA ORBICULATA, Binney non Say, Pl. lxxiii. last line, middle figure, is *Hel. tropica*, Jahn.

HELICINA CHRYSOCHEILA, Binney, pl. lxxiv. f. 4. I have specimens of this shell in my cabinet, and consider it distinct from *Hel. Jamaicensis*, Sowb., and all other described species. I have a note taken by my father at the collection of M. Petit de la Saussaye in Paris, in which he says that a similar shell is labelled from Tampico. Compare *Hel. turbinata*, Wiegman, Ch. ed. 2, pl. iv. f. 13, 14, 15.

Notes on American Land-Shell, deposited by Mr. Say, and still preserved in the collection of the Academy.

HELIX LUCUBRATA, Say. I have lately found among the shells of the Academy three specimens of a shell labelled many years ago, "*Helix lucubrata*, Say—Mexico." I have made a very critical comparison of them with authentic specimens of *H. caduca*, Pf., received through the kindness of Mr. Cuming. I am now confirmed in the opinion I expressed before, that the two shells are undoubtedly identical. The resemblance of these Mexican shells to *H. fuliginosa*, Binney, is strong enough to have given Dr. Griffith the impression that they were the

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same. He expressed himself to that effect in letters to my father. From Dr. Griffith, Prof. Adams may have received the same impression (see Vt. Moll.) I am inclined to differ from them, believing the species, though nearly allied, to be quite distinct. Until we receive the true *H. fuliginosa* from the South-western States, I shall doubt its existence there. Our country has been too little searched, however, to allow us to draw very nicely the lines of geographical distribution. If I am correct in my view of this species, Mr. Say's name will, of course, take precedence over that of Dr. Pfeiffer.

HELIX CLAUSA. The specimens are much more globose than that figured in Am. Conch. The aperture is quite orbicular.

HELIX APPRESSA, HIRSUTA, INFLECTA, PROFUNDA, AURICULATA, LIGERA, SOLITARIA, SUPPRESSA.

H. FATIGIATA, as fig. in Terr. Moll. iii. pl. xxxix, f. 4.

H. FLICATA. Like *Troostiana*, Lea.

H. FALLAX. The upper denticle on the peristome placed within the aperture, like that of *H. vultuosa*, Gould.

H. SEPTEMVOLVA. Large and small var. of *cereolus*, Mhtl.

SUCCINEA AVARA, CAMPESTRIS. Same as figured in Terr. Moll.

HELICINA ORBICULATA, OCCULTA, (fossil.)

PUPA PENTODON, CORTICARIA, ARMIGERA.

ACHATINA SOLIDA. More elongated than that fig. in Terr. Moll.

November 3d, 1857.

Vice President LEA in the Chair.

Mr. Slack remarked, that the specimens of chalcedony and quartz presented by him this evening, had been obtained from a quarry on the left bank of the Nile, whence was procured the limestone used in the erection of the Pyramids. They appear to have been rejected by the workmen when selecting the lime.

November 10th, 1857.

MR. CASSIN in the Chair.

Dr. Morris called the attention of members to an appearance of the eastern horizon just before, at and after sunset. On any clear evening, after a warm day, a person looking towards the east a few minutes before sunset, will observe a red band of light extending along the whole horizon; above, it is gradually shaded into yellow light, which passes into greenish, and finally into blue, at various distances from the zenith. As the sun descends in the west, these bands of red and yellow light rise in the east, until the red makes an angle of about 15° with the plane of the horizon, leaving a clear dark blue space beneath. The colors are brightest about ten minutes after apparent sunset: after which they gradually fade away. A cloudy or misty state of the atmosphere near the zenith of the observer obscures or prevents the occurrence of the phenomenon: but a fog-bank in the horizon does not interfere. In Kæmtz's Meteorology, translated by Walker, page 408, the same phenomenon is partially described, but he places the "white or yellow stripe" between the red and the blue of the horizon, or below the red. I have never seen it anywhere but as above. Kæmtz thinks that the blue is due to the shadow of the earth projected against the eastern sky, while the red 1857.]

band is caused by the absorption of the other constituents of white light in traversing so great an amount of atmosphere. This hypothesis is also maintained by Mr. Martin in his Notes, F. p. 497: and he gives a much fuller and better account of the phenomenon as observed in morning twilight by M. Bravais from the summit of the Faulhorn. If it were really due to this cause, no reason could be assigned for the gradual fading and disappearance, first of the yellow and then of the red light, when they have risen about 20° above the horizon; they ought to follow the sun completely across the sky. I believe the phenomenon to be due to the formation of an iris by the sun's light falling on the vapor of the atmosphere which has become partially condensed as the sun has receded; probably this will be found to correspond with the iris given by five internal reflections and two refractions of the sun's rays.

November 17th, 1857.

Vice President LEA in the Chair.

The following papers were presented for publication in the Proceedings:

"Descriptions of some new Reptiles collected by the U. S. Exploring Expedition, under the command of Capt. Chas. Wilkes, U. S. N., by Charles Girard."

"Notices of new Genera and species of marine and fresh-water fishes from Western North America, by Charles Girard."

"Description of a new species of *Cypselus*, collected in the N. W. Boundary Survey, A. Campbell, Esq., Commissioner, by C. B. R. Kennerly, Surgeon and Naturalist of the Expedition."

"Notes on the American species of *Archibuteo* and *Lanius*, and Description of a new species of Toucan, of the genus *Selenidera*, by John Cassin."

Which were severally referred to Committees.

Mr. Cassin read the following extract from a letter of Mr. P. B. DuChailu.

Fernando Paz River, August 17th, 1857.

"While hunting after the Gorilla a few days ago, I met with a male surrounded by a few females. The male has a red crest, like a cock.

"Both the guinea fowl and the black pheasant are birds which are not seen before you reach fifty or sixty miles in the interior, and are unknown to the natives of the sea shore. The birds of the Fernando Paz country, until you reach the interior, are exactly the same as those of Cape Lopez, the country being similar in appearance. At the Cape properly there is no town: the largest town of the Cape Lopez people is Sangatonga, situated in the bay formed by the Cape. It is the residence of the king, and is situated in a beautiful prairie at the foot of a hill rising about two miles in the interior. The soil of Cape Lopez is generally light and sandy; the country presents an aspect quite different from that between Fernando Pô and the Gaboon, looking a good deal like the countries of Southern Africa toward the Cape of Good Hope—large prairies with groves of trees. In these groves the Cape Lopez people have their plantations, as the soil is good. Sweet potatoes, cassada, plantain, ground nuts and sugar cane are the products. They plant in pretty large quantities, as these form the main staple of their food; sweet potatoes, especially, grow well. Good roads could easily be made, and would be a powerful aid to colonization. The raising of cattle could be made a profitable business, for the prairie land would afford good grazing. A good many wild cattle are seen wandering over the

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prairies. Water seemed to be rather scarce, having met, during a journey of sixty miles into the interior, but four streams: but the natives have assured me that at the bottoms of the hills in the midst of the groves there are a good many brooks. So far as I have been into the interior I found the country hilly: I did not meet with marshy ground but at a single place, and that marsh was small. About fifty miles in the interior the prairies become smaller and woods take their place. The country through which I passed was thinly populated: the people have generally to stay on or near the Gaboon or Nazareth rivers or their tributaries. This want of population would be a drawback to colonization, as would also the want of a good harbor. The country near the Nazareth is better off in this respect."

November 24th, 1857.

Vice President BRIDGES in the Chair.

The Committees to whom were referred the following papers, reported in favor of publication, viz:

"Descriptions of some new Reptiles, collected by the U. S. Exploring Expedition under the command of Capt. C. Wilkes, U. S. N., by Chas. Girard."

"Notices of new genera and new species of marine and fresh-water Fishes, from Western North America, by Chas. Girard."

"Description of a new species of *Cypselus*, &c., by C. B. R. Kennerly."

The Committee on Col. Abert's "Description of a Mocking bird, supposed to be new," was discharged at its own request.

Descriptions of some new Reptiles, collected by the United States Exploring Expedition, under the command of Capt. Charles Wilkes, U. S. N.

FOURTH PART.—Including the species of *Saurians*, exotic to North America.

BY CHARLES GIRARD, M. D.

SCINCIDÆ.

1. *CRYPTOBLEPHARUS EXIMIUS*.—Scales disposed upon twenty-four longitudinal series, around the middle region of the body. Subcaudal scales equal or subequal. Back greenish; two light lines, or streaks, on each side; beneath unicolor.

Locality.—Feejee islands.

2. *EUPREPIS VENUSTUS*.—Body and head slender and depressed; tail subconical posteriorly. Forty-three to forty-five longitudinal series of scales. Pre-frontal plate lozenge-shaped. External row of preanal scales larger than the rest. Back chestnut brown; a black streak from the eye to the base of the tail, margined, superiorly, by a fuliginous line, extending from the supraciliary region to the anterior third of the tail, and, inferiorly, by a yellow line from the axilla to the groin; lower portion of the flanks yellow, speckled with black. Throat whitish; abdomen light brown, unicolor.

Locality.—Cape de Verde islands.

CYCLODINA, (nov. gen.).—Body elongated, slender, subquadrangular, depressed, covered with large scales, striated under the epidermis. Head small, depressed, anteriorly obtuse. Nostrils in one plate; no supranasals; a pair of parietals. Maxillary teeth conical; palate toothless. Tongue flat, scaly, nicked at the extremity. Lower eye-lid scaly. Auricular apertures simple. Limbs four, weak, far apart, five fingers and five toes, rather short, subcylindrical and clawed, their inferior aspect transversally plated, smooth; palms and soles coarsely granular or subtubercular. Tail moderate.

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3. *CYCLODINA MENNA*.—Body rather long, protected by twenty-six longitudinal series of scales. Snout short. Suborbital chain of plates complete: no labials entering into the orbit. Auricular aperture small. Two middle preanal scales larger than the rest. Limbs quite small. Golden green, back speckled with black; a dark chestnut or blackish streak along the upper portion of the flanks, obsoletely white lined above. Sides speckled with white and black. Under surface of head and throat speckled with black; abdomen light yellowish, unicolor.

Locality.—New Zealand.

HOMBRONIA, (nov. gen.)—Body subtetragonal and depressed, protected by moderate and striated scales; the two preanal ones larger than the rest. Head depressed, subtriangular; two parietal plates; an odd occipital, and two latero-occipitals. Nostril in one plate; no supranasals. Maxillary teeth subconical; palate toothless. Lower eyelid with a transparent disc. Auricular aperture simple; tympanum, rather deeply seated. Limbs weak, far apart; five fingers and five toes, unequal, with transverse, carinated plates beneath; palms and soles granular. Tail long, stoutish, subcylindrical, with subequal scales.

4. *HOMBRONIA UNDOSA*.—Twenty-eight longitudinal series of scales. Rostral plate elevated, subconical; nasals and postfrontals separated. Transparent disc of lower eyelid subcentral. Auricular aperture very small. Caudal scales much larger than the dorsal and abdominal ones. Tail long. Brown, sides with an obsolete, undulating streak of deep chestnut; beneath lighter, unicolor.

Locality.—New Zealand.

5. *HOMBRONIA FASCIOLARIS*.—Twenty-six longitudinal series of scales. Rostral plate low, hemi-discoid; nasals wide apart; postfrontals nearly contiguous. Transparent disc of lower eyelid subcentral. Auditive aperture very large. Caudal and dorsal scales subequal. Tail very long. Greenish olive; back speckled; upper part of sides with a dark streak; lower part and belly lineolated with greyish.

Locality.—New Zealand.

OLIGOSOMA, (nov. gen.)—Body subcylindrical, rather short, covered with moderate and striated scales; two middle dorsal series largest. Head subquadrangulo-pyramidal, depressed; nostrils lateral; no supranasal plates. Parietals separated. Palate toothless. Lower eyelid with a transparent disc. Auricular aperture subdenticulated in front, or simple; tympanum more or less sunk. Limbs moderately developed; five fingers and five toes, unequal; palms and soles finely granular; subdigital plates transverse, smooth. Tail long, subcylindrical and tapering.

Mococa zelandica, GRAY, is the type of this genus, to which also belongs *Scincus noctua*, of Lesson.

6. *LIPINIA VULCANIA*.—Dorsal scales disposed upon thirty longitudinal series. Prefrontal plates large, subquadrangular; postfrontals contiguous; supraoculars quite large; two slender, vertically elongated lorals. Temporal shields, scale-like. Brown, with a lateral darker streak; beneath unicolor.

Locality.—Caldera on Mindanon.

LYGOSOMELLA, (nov. gen.)—Body depressed, elongated, covered with moderate and striated scales. Head subquadrangulo-pyramidal, depressed; nostrils lateral; no supranasal plates; parietals separated. Palate toothless. Lower eyelid with a transparent disc. Auricular aperture denticulated in front; tympanum deeply seated. Limbs small, far apart; five fingers and five toes, unequal; palms and soles finely tubercular; subdigital plates transverse, smooth. Tail moderate, subconical and tapering.

7. *LYGOSOMELLA ÆSTUOSA*.—Body rather long, protected by thirty-six longitudinal series of scales. Snout elongated; fifth upper labial entering into the orbit. Auricular aperture small, slightly denticulated in front. Preanal scales subequal. Olivaceous brown, with a pale streak along the upper portion of the

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flanks, margined with black. Dorsal region and sides somewhat speckled with black and white. Abdomen unicolor; throat and chin speckled with black.

Locality.—New Zealand.

EMOA (nov. gen.)—Body elongated, subfusiform, more or less depressed, covered with smooth, though substriated scales. Head subquadrangulo-pyramidal; a pair of supranasal plates; parietals united into one; middle occipital sometimes combined with the united parietals; a pair of postoccipitals. Maxillary teeth rather short and subconical; palate toothless. Lower eyelid with a transparent disc; auricular aperture denticulated or simple; tympanum deeply seated; limbs well developed; palms and soles granular; five fingers and five toes, compressed, unequal, clawed; subdigital plates numerous and smooth. Tail elongated and tapering.

8. **EMOA NIGRITA**.—Body stoutish, covered with thirty-eight longitudinal series of well developed scales. Postfrontal plates not contiguous; middle occipital distinct; auricular aperture moderate; subcircular and simple; preanal scales larger than the rest; tail subcylindrical, of moderate length; uniform brownish black above; lighter beneath.

Locality.—Navigator Islands.

GEKKOTIDAE.

9. **GEHYRA VORAX**.—Fingers and toes broad and rather short; dorsal scales small and uniform; abdominal scales subpyramidal in outline; brown or greyish brown above, maculated with black; beneath whitish, dotted with black.

Localities.—Feejee Islands.

10. **PEROPUS NEGLECTUS**.—Eye large; mental shields small and polygonal; tail laterally serrated; above brown with black markings; beneath unicolor.

Locality.—Rio de Janeiro, Brazil.

11. **DACTYLOPERUS INSULENSIS**.—Scales along the middle region of the back smaller than on the sides; upper surface of head and tail granular; four mental shields, placed side by side; greyish brown above; minutely speckled with black; whitish beneath.

Locality.—Sandwich Islands.

12. **DORYURA VULPECULA**.—Head quite depressed and subacute anteriorly. Neck swollen. Back covered with minute equal granules, and tail with small scales. Four mental shields disposed upon a square, anteriorly contiguous to the labial plates. Tail tapering, nearly even laterally. Grey or yellowish brown, lighter beneath than above, and occasionally spread over with pale dots.

Locality.—Sandwich Islands.

13. **HOPLODACTYLUS POMABII**.—No mental shields, instead of which some very small plates. Abdominal scales very small, subcircular or subrhomboid. Upper regions of a dark reddish ground over which are arranged longitudinally elongated black blotches more or less confluent; beneath greyish, unicolor.

Locality.—New Zealand.

14. **HETERONOTA PELAGICA**.—Nostrils lateral, situated above the commissure between the rostral plate and the first labial. One pair of quadrangular, contiguous, internasal plates, and a small tubular post nasal. A pair of small mental shields. Eighteen longitudinal series of tubercles. Brown, maculated above with black; unicolor beneath.

Localities.—Feejee and Navigator Islands.

IGUANIDÆ.

SACCODEIRA, (nov. gen.)—Cephalic plates rather small, multicarinated. Nostrils lateral, placed immediately above the supraciliary crest. Temporal scales
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carinated and imbricated. Auricular aperture denticulated in front. Sides of the neck, pouched, with small exteriorly and small granules within the pouches. A vertico-oblique fold in advance of the shoulder. Dorsal scales moderate; conspicuously carinated, acuminate, central dorsal series simulating a low crest. Abdominal scales smooth and entire. Femoral and preanal pores none. Tail broad at the base, compressed and tapering posteriorly. Fingers and toes, five, slender, unequal.

15. *SACCODEIRA ORNATISSIMA*.—Cephalic plates very small and nearly equal sized. Supralabials in one series, slender and smaller than the labials. Temporal scales quite small. Auricular aperture large. Scales subequal; dorsal and lateral ones subanceolated and carinated; abdominal ones posteriorly rounded. Posterior aspect of thighs minutely and wholly granular. Greyish brown above, with a double series of dark brown, subtriangular spots along the dorsal region. Limbs maculated. Upper surface of head blackish; sides and under surface whitish, with small jet black spots. Abdomen dull yellow, unicolor.

Localities.—Obrajillo and Yanga, Peru.

16. *PROCTOTRETUS SPLENDIDUS*.—*Proctotretus pectinatus*, BELL, Zool. Voy. Beagle, v, 1843, 18, Plate ix, fig. 2.—Labial plates narrow and long, somewhat larger than the supralabials, which are disposed upon two series. Temporal scales imbricated. Auricular aperture small. One series of infralabials, narrower than the lower labials. Three pairs of mental shields. Three pectinated crests, one along the dorsal line, and one on each side of the back. Emerald green above with five series of chestnut brown, black margined spots. The lateral pectinated crests bright yellow. Head transversally streaked with bright yellow. Sides and limbs variegated with brown upon a fawn yellow ground. Beneath white.

Locality.—Patagonia.

RHYTIDODEIRA, (nov. gen.)—Cephalic plates rather well developed or moderate sized, not imbricated, smooth; one series of supralabials. Nostrils lateral. Temporal scales imbricated, smooth or subcarinated. Auricular aperture granular, tubercular or subdenticulated in front. Sides of the neck folded, granular; a vertico-oblique scapular fold. Dorsal scales rhomboid, carinated, acuminate; abdominal scales rhomboid also, smooth, generally entire posteriorly. Thighs either wholly granular or provided with a patch of scales near the tail. Coloration: Longitudinal streaks of various hues with intervening series of spots; occasionally, however, transversally banded.

Observation.—To this genus belong: 1. *Proctotretus kingii*, BELL; 2. *Proctotretus magellanicus*, HOMBR. & JACQ.; 3. *P. bibroni*, BELL; 4. *P. wiegmanni*, DUM. & BIBR.; 5. *Tropidurus nigromaculatus*, WIEGM.; 6. *Tropidurus ozycephalus*, WIEGM.

EULAEMUS (nov. gen.)—Cephalic plate moderate sized, else well developed, smooth; one series of supralabials. Nostrils lateral. Temporal scales subimbricated, subcarinated or smooth. Auricular apertures large, denticulated or tubercular in front. Sides of the neck folded and granular; a vertico-oblique scapular fold. Dorsal scales moderate, subrhomboid, slightly carinated, posteriorly obtuse; lateral scales rather smaller or subequal; abdominal scales rhomboid or rounded, and entire. Thighs wholly granular, else minutely scaly. Coloration: Transverse black or brown spots or bands, generally light margined, upon a rather dark ground; longitudinal streaks obsolete, if at all present.

Observation.—This genus embraces: 1. *Proctotretus tenuis*, DUM. & BIBR.; 2. *P. darwini*, BELL; 3. *P. pictus*, DUM. & BIBR.; 4. *P. fitzingerii*, DUM. & BIBR.; 5. *P. fitzingerii*, BELL. (*E. affinis*, GRD.); 6. *P. signifer*, DUM. & BIBR.; and 7. *Lio-læmus maculatus*, GRAY.

ORTHOLÆMUS (nov. gen.)—Cephalic plates rather small, not imbricated, smooth; three or more series of supralabials. Nostrils superior. Temporal

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shields smooth, not imbricated. Auricular aperture moderate, simple. Sides of the neck ridged or rumpled, granular; a vertico-oblique fold in advance of the shoulder. Dorsal scales small, slightly carinated, posteriorly obtuse; lateral scales a good deal smaller, subgranular. Abdominal scales rhomboid or sublanceolated, entire or subfimbriated posteriorly. Thighs either wholly granular or with a patch of scales near the tail. Coloration: Dark spotted upon a light ground, and occasionally speckled also.

Observation.—*Proctotretus maculatus*, DUM. & BIBR.; and *P. wiegmanni*, BELL, (*O. fitzroii*, GRD.) belong to this genus, together with the following one.

17. *ORTHOLEMUS BEAGLII*.—*Proctotretus multimaculatus*, BELL, Zool. Voy. Beagle, v, 1843, 17, pl. ix, fig. 1.—Head short, depressed, wedge shaped. Snout rounded. Three series of supralabials, smaller than the labials. Lower labials larger than the upper labials; three series of infralabials. Seven or eight pairs of mental shields. Temporal scales small and subconvex. Auricular aperture moderate. Dorsal scales smaller than the abdominal ones, which are subrhomboid, rather acuminate and subfimbriated. Upper part of flanks subgranular. Posterior aspect of thighs granular with a patch of scales near the tail. Olive brown above, maculated with black; a jet black humeral spot; beneath whitish yellow, unicolor.

18. *AMPHIBOLURUS MACULIFERUS*.—A diminutive scaly ridge along the middle line of the back. Sides of the hind part of the head spineless. Scales of the throat, abdomen and inferior surface of the limbs obsoletely carinated, those of the throat not hanging down, sides of the body with some short and erect scales. Tail without cross rows of spines above. Yellowish, with transverse blackish bands on the back, limbs and tail; belly and tail beneath unicolor, throat and limbs dark speckled.

Locality.—New South Wales, Australia.

OREODEIRA (nov. gen.).—Head depressed, rather broad and short, covered with small subtuberculous and subimbricated plates. Occipital plate rather large. Nostrils lateral, situated within the extension of the supraciliary ridge along the snout. Supralabial plates and temporal scales carinated. Tongue fleshy, anteriorly notched or bifid. Compressed and cutting teeth on the sides of the jaws and subconical incisors anteriorly. Auricular aperture moderate, subserrated; tympanum situated near its surface. A gular and a pectoral cross fold; sides of the neck variously folded or rumpled. Nape with a small crest vanishing away along the back. Scales on the back moderate, homogeneous, keeled, disposed upon oblique series; on the abdomen, small, subequal and keeled also; on the occiput and neck very small, subgranular. Limbs slender and elongated, terminated by five fingers and five toes, slender, compressed, unequal, clawed. Tail slender, subconical, and tapering. Femoral and preanal pores wanting.

Observation.—This genus belongs to the group of Phrynocephali, and as far as we know, is the only one found in Australia.

19. *OREODEIRA GRACILIPES*.—Three complete series of supralabials, smaller than the labials; infralabials constituting likewise three series. Mental shields quite small, scarcely distinguishable from the infralabials. Posterior aspect of thighs, scaly. Caudal scales conspicuously larger than the dorsal and abdominal ones. Brownish olive above, anteriorly maculated; beneath yellowish-olive; chin obsoletely spotted.

Locality.—New South Wales, Australia.

Notice upon new Genera and new Species of Marine and Fresh-water Fishes from
Western North America.

BY CHARLES GIRARD, M. D.

I. PERCOIDS AND CATAPHRACTI.

1. *POMOXIS NITIDUS*.—Posterior extremity of maxillary bone corresponding to a line intersecting the pupil. Insertion of ventrals situated opposite the inferior edge of the base of the pectorals. Anterior spiny ray of anal fin under the fourth dorsal one. Posterior margin of caudal fin subconcave. Upper regions reddish, spotted and fasciated with brown; inferior regions silver and golden. Collected in Houston River, Ky., by E. L. Berthoud, Esq.

2. *CALLIURUS MELANOPS*.—Mouth very large; gape directed obliquely upwards. Posterior extremity of maxillary extending to a vertical line drawn posteriorly to the orbit. Eye large. Insertion of ventrals situated opposite the base of the pectorals, a little in advance of the origin of the dorsal; their tips not extending to the vent. Scales very large. Ground color reddish brown, with a blackish spot upon the centre of each scale. A black patch at the upper and posterior margin of the opercle. Soft portion of dorsal and anal fins spotted upon their base.

Inhabits the fresh waters of Texas.

3. *CALLIURUS DIAPHANUS*.—Mouth large; gape oblique upwards. Posterior extremity of maxillary extending to a vertical line drawn in advance of the pupil. Eye large. Insertion of ventrals situated posteriorly to the base of the pectorals, and the origin of the dorsal; their tips overlapping the vent. Scales large. Greyish olive above; yellowish or whitish beneath. Soft portion of dorsal and anal fins provided with a black spot.

Caught in the Rio Blanco, Texas.

4. *CALLIURUS FORMOSUS*.—Mouth large; gape oblique upwards. Posterior extremity of maxillary extending to a vertical line passing beyond the middle of the pupil. Eye moderate. Insertion of ventrals situated under the base of the pectorals and a little posteriorly to the anterior margin of the dorsal; their tips reaching the vent. Scales moderate. Reddish-brown above, spotted with black; greyish beneath. Soft portion of dorsal and anal fins provided with a black patch.

Inhabits the fresh waters of Arkansas, chiefly.

5. *CALLIURUS MICROPS*.—Mouth moderate, gape oblique upwards. Posterior extremity of maxillary extending to a vertical line drawn midway between the anterior rim of the orbit and the pupil. Eye small. Insertion of ventrals situated posteriorly to the base of the pectorals and the origin of the dorsal; their tips not reaching the vent. Scales moderate. Reddish-brown above with centre of scales lighter; greyish beneath. Soft portion of dorsal provided with a black patch.

Collected in the Rio Brazos, Texas.

6. *CALLIURUS MURINUS*.—Mouth moderate, gape oblique upwards. Posterior extremity of maxillary extending to a vertical line drawn inwardly to the anterior rim of the orbit. Eye moderate. Insertion of ventrals situated posteriorly to the base of the pectorals and opposite the origin of the dorsal; their tips reaching the vent. Scales large. Dark blackish brown. Soft portion of dorsal fin provided with a black patch.

From Texas.

7. *BRYTTUS ALBULUS*.—Body subelliptical, rather contracted and deep. Nape convex, and snout subconical. Posterior extremity of maxillary extending to a vertical line drawn anteriorly to the orbit. Insertion of ventrals situated pos-

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teriorly to the base of the pectorals and the anterior margin of the dorsal; their tips overlapping the vent. Scales rather large. Pale reddish brown, lighter beneath than above. Fins greyish olive; dorsal with a black patch.

Collected in the Rio Blanco, Texas.

8. *BRYTTUS SIGNIFER*.—Body contracted and deep. Nape convex and snout subconical. Posterior extremity of maxillary extending to a vertical line drawn in advance of the pupil. Insertion of ventrals situated posteriorly to the base of the pectorals and the origin of the dorsal; their tips overlapping the vent. Scales moderate. Reddish brown, lighter beneath than above. Dorsal and anal fins provided with a black patch.

Caught in the Rio Medina, Texas.

9. *BRYTTUS HUMILIS*.—Body subelliptical. Nape convex and snout subconical. Posterior extremity of maxillary extending beyond the anterior rim of the orbit. Insertion of ventrals situated posteriorly to the base of the pectorals and a little in advance of the origin of the dorsal; their tips overlapping the vent. Scales large. Reddish brown or dusky, maculated. Fins unicolor; dorsals sometimes blotched.

Inhabits the fresh waters of Arkansas.

10. *POMOTIS LUNA*.—Body subcircular when viewed in profile. Head moderate; snout subconical. Mouth small; posterior extremity of maxillary extending to a vertical line drawn in advance of the anterior rim of the orbit. Eye moderate. Suborbital and suprascapular bones not crenated. Edge of preopercle very slightly crenated. Opercular flap small. Spinous portion of dorsal fin of moderate height and lower than the soft; its origin being situated opposite the base of the pectorals and consequently in advance of the origin of the ventrals. Caudal fin posteriorly emarginated. Tips of ventrals overlapping the vent, but do not reach the anterior margin of the anal fin. Extremities of pectorals nearly even with the tips of ventrals. Greenish-brown above, yellowish beneath; sides of head with blue and yellow lines. Fins unicolor, vertical ones greyish olive, the others yellowish.

Collected at Fort Snelling, Minnesota.

11. *LUCIOPERCA BOREA*.—Body slender, elongated and subfusiform. Snout conical. Mouth deeply cleft; posterior extremity of maxillary extending to a vertical line drawn posteriorly to the orbit. Scales on the cheek and opercle not deciduous, larger upon the opercle than upon the cheek. Insertion of ventrals situated posteriorly to the base of pectorals, and a little anteriorly to the origin of the first dorsal. Posterior margin of caudal fin crescent-shaped. Anus placed opposite the anterior margin of the second dorsal fin. Yellowish or olivaceous, spotted with black.

From Fort Sarpi, Nebraska.

CHIROPSIS.—Body subfusiform, head well developed. Mouth of medium size; slender canine teeth on both jaws; velvet-like teeth on the front of the vomer and along the palatines. Opercle and preopercle without either spines or serratures. Cheeks, opercular apparatus, and upper surface of head covered with small scales. A supraocular, arborescent, membranous flap. Gill opening continuous under the throat. Branchiostegal rays six in number. Two dorsal fins, a spinous and an articulated one, occupying most of the dorsal region. Insertion of ventrals situated behind the base of the pectorals. Caudal fin posteriorly rounded or subtruncated. Scales finely pectinated posteriorly. Several lateral lines.

This genus is to include the species which we have formerly described under the names of *Chirus pictus*, *C. guttatus*, and *C. constellatus*.

12. *OLIGOCOTTUS ANALIS*.—Head subconical. Mouth moderately cleft; posterior extremity of maxillary extending to a vertical line drawn across the posterior rim of the pupil. Preopercular spine moderate. Two acute nasal spines.

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Dorsal fins contiguous. Origin of anal situated posteriorly to the anterior margin of the second dorsal. Dorsal region prickly. Greenish olive, maculated and spotted with black. Abdomen whitish, unicolor.

Collected at Monterey, Cal.

13. *OLIGOCOTTUS GLOBICEPS*.—Head rounded anteriorly. Mouth moderately cleft; posterior extremity of maxillary bone extending to a vertical line drawn posteriorly to the pupil. Rudimentary spines upon the preopercle. Two acute nasal spines. Dorsal fins separated. Origin of anal situated somewhat posteriorly to the anterior margin of the second dorsal fin. Reddish brown, upper regions maculated with black; beneath unicolor and lighter than above.

From S. Farallones, Cal.

ZANIOLEPIS.—Upper surface of head spineless. Preopercle spinous. Mouth moderate, with its gape horizontal and the jaws subequal. Card-like teeth upon the premaxillaries, dentaries, front of vomer, and palatines. Gill openings continuous under the throat; branchiostegals six on either side. Dorsal fins contiguous; anterior one larger than the second. Caudal posteriorly subcrenate. Insertion of ventrals situated posteriorly to the base of the pectorals. Dermic productions comb-like.

14. *ZANIOLEPIS LATIPINNIS*.—Three small spines upon the convexity of the preopercle. First dorsal much longer than the second, with its anterior two rays prolonged beyond the others. Anal fin longer than the soft dorsal and provided with three spiny rays. Upper surface and sides of head prickly and rough like the surface of the body. Color yellowish-brown; fins spotted or barred with black.

From Fort Steilacoom, Puget Sound.

15. *BLEPSIAS OCULOFASCIATUS*.—Posterior extremity of the maxillary bone extending to a vertical line drawn across the anterior rim of the pupil. First dorsal anteriorly filiform. Extremities of posterior rays of both the dorsal and anal, projecting beyond the insertion of the caudal. Anal fin shorter than the second dorsal, and not as deep as the latter is high. Ground color of a uniform rusty red. A black band crosses the eye, through the pupil, and extends across the cheeks.

Collected at Fort Steilacoom, Puget Sound.

Description of a new species of *CYPSELUS*, collected on the North Western Boundary Survey, Archibald Campbell, Esq., Commissioner.

BY C. B. R. KENNERLY, M.D.

Surgeon and Naturalist to the Commission.

CYPSELUS BOREALIS, Kennerly.

Tail slightly forked, wings long, extending $1\frac{1}{2}$ inch beyond the tail; first primary about a line longer than the second.

Color sooty, approaching to black; top of head ashy brown, formed by the whitish tips of the feathers. In front of the eye a small semicircular space of black, over and in front of which is a line of gray; chin and throat dusky; tips of small feathers on the shoulder grayish, also those of the undertail coverts; eyes black.

Length $6\frac{1}{2}$ inches, extent of wings 17 inches, from metacarpal joint to end of wing $6\frac{1}{2}$ inches, tarsus .54 of an inch. Toes long and slender and armed with long, sharp claws.

Found at Simiahmo Bay, Puget Sound, near the 49th parallel of latitude, Washington Territory, July 1857. Male.

This species is readily distinguished from any heretofore known to inhabit North America, by its large size, the form of the tail, and the absence of the

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sharp terminal points of the tail feathers. It has also longer and more slender toes.

A number of these birds were observed for several evenings flying near our camp in company with large numbers of *Cypselus Vauxii*. They kept for the greater part near the edge of the forest, and generally flew so high as to be out of the reach of shot of any usual size. One specimen was obtained, which is a male, in apparently adult plumage, and is described above.

December 1st, 1857.

Vice-President BRIDGES in the Chair.

A communication was received from M. Belhomme, Chef du Jardin Botanique de Metz, (Moselle,) detailing some investigations made by him with reference to a carmine obtained from *Monarda didymia*, and a new alkaloid from *Atropa belladonna*, called by him Belladonnine; which was referred to the Committee on Proceedings.

A letter was received from E. B. Plympton, dated Providence, R. I., Nov. 27th, 1858, announcing the decease of Dr. W. Blanding, late a Correspondent of the Society. Mr. Cassin and Dr. Hays remarked on Dr. Blanding's devotion to Natural History, and the interests of the Academy.

The following papers were presented:

Description of several new North American Reptiles, by E. Hallowell, M. D.

Intended for publication in the Proceedings.

Descriptions of Exotic Genera and Species of the Family Unionidæ, by Isaac Lea, LL. D.

Intended for the Journal.

Which were referred to the Committees, as usual.

Dr. J. A. Meigs announced the death, at Panama, on the 16th inst., of Mr. Geo. R. Gliddon, late a correspondent of the Academy.

On leave granted, Dr. Leidy offered the following resolutions, which were seconded by Mr. W. Parker Foulke:

Resolved, That the members of the Academy have learned with deep regret the death of their late Correspondent, Geo. R. Gliddon, Esq., by whom the subject of Egyptian antiquities was first made familiar to the public mind of the United States; through whose services mainly, our late President, Dr. Morton, received those indispensable materials for his work on Egyptian Craniology, which now enrich the Museum of the Academy; and whose indefatigable efforts were constantly given towards promoting a rapid interchange of information between the learned of both hemispheres, upon subjects of leading importance in Natural History.

Resolved, That the members of the Academy desire to bear witness to the extraordinary and disinterested zeal manifested by Mr. Gliddon, during the period of his personal connection with the labors of this Institution; and to his sincere and ardent pursuit of what appeared to his own judgment as scientific truth; and they also desire to record their appreciation of the kind and friendly relations which it was his constant and successful endeavor to maintain with them.

Resolved, That the members of the Academy tender to the beloved wife of Mr. Gliddon, his companion and aid in much of his valuable labor, their most respectful and hearty sympathy.

Which were unanimously adopted.

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Dr. Bridges announced the death of Mr. Chas. McEuen, late a member of the Academy.

Dr. Leidy called the attention of the members to a bottle containing numerous specimens of a large species of *Gordius* discovered by Dr. Wm. A. Hammond, 525 miles west of Fort Riley, Kansas Territory. Dr. Hammond states they were found in a pond in great numbers, in company with *Siredon*. They swam actively forward an inch or two beneath the surface of the water, and occasionally lifted the anterior end even above the latter..

The collection contains 24 females and the same number of males. The females are cylindrical, light brown of various shades, shining, iridescent; anterior extremity narrowed; head surrounded with a dark brown ring; tail obtuse, slightly compressed, with a terminal genital pore. The males are darker colored than the females; tail extremity more or less spirally enrolled, with the extremity bifurcated; forks divergent, incurved, smooth, connected at base anteriorly by a crescentic fold, in advance of which is the genital pore; head as in the female.

The females measure from 10 inches in length by $\frac{1}{4}$ of a line thick, to 2 feet 6 inches in length and 3-5ths of a line thick; the males 8 inches in length by $\frac{1}{4}$ of a line thick, to 2 feet 2 inches in length by 2-5ths of a line thick.

Dr. Leidy next directed the attention of the members to a bottle containing seven specimens of the larva of a species of *Oestrus* or bot-fly. They were obtained by Dr. Hammond from a pouched rat, *Thomomys borealis*, at Bridger's Pass, on the summit of the Rocky Mountains, July 1857. Dr. Hammond found the rat panting on the road side, without power of escaping. The bots were found situated beneath the skin of the back, belly, and thigh.

The body of these larvæ is oblong oval, compressed, incurved; head minute, composed of a transverse pair of papillary eminences, each supporting two minute ocelli, and having projecting from beneath, forward and downward, a pair of strong black hooks. Spiracular laminæ trilobed and marked with vermicular lines. Segments of the body closely covered with discoidal corneous tubercles, of which the anterior ones have their posterior border projecting and dentated.

The smallest is light yellowish brown; and as they become larger they assume a darker tint. The largest are black, hard, shining and remarkably shagreened in appearance.

Length of the smallest larva 5 lines, breadth 3 lines, thickness $2\frac{1}{2}$ lines; length of largest 9 lines, breadth $5\frac{1}{2}$ lines, thickness 3 lines.

December 8th, 1857.

Vice-President BRIDGES in the Chair.

Dr. Leidy called the attention of the members to a drawing of a curious animalcule, found attached to stones and dead stems of plants in the Delaware and Schuylkill rivers. The animal, though closely allied in structure to the Rotatoria or wheel animalcules, yet possesses no rotary or other ciliated apparatus. The body is regularly oval, transparent, colorless, and finely tuberculated. From the anterior truncated extremity of the body, the animal projects and retracts at will a delicate cup-shaped membrane about half the size of the body. The membrane exhibits delicate and distant longitudinal and circular muscular fibres, which are branching. At the bottom of the cup the mouth communicates with a capacious stomach, and this with a muscular gizzard with lateral jaws, as in most rotifers, and which, as in these, are constantly in motion. From the gizzard opens a second stomach, which communicates with a short intestine terminating in a posterior anal aperture. The digestive apparatus is attached to the outer tunic of the body by diverging muscles. The visceral cavity usually contains numerous eggs in various stages of development, from that containing the germinal vesicle to such as contain the fully formed embryos. Attached to the inner surface of the body are a number of opaque, white, irregularly oval bodies.

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The size of the animalcule is about the 1-5th of a line in diameter. It appears to be permanently fixed to the positions in which it is found. When disturbed, it folds up its oral cup like an umbrella and retracts it within the body. By means of it, it catches its prey, which consists of smaller animalcules. From the stomach of one individual I squeezed out as many as fifty of the latter.

For the genus and species the name *Dictyophora vorax* is proposed.

December 15th, 1857.

Vice-President BRIDGES in the Chair.

A paper was presented for publication in the Proceedings, entitled "Prodromus Descriptionis Animalium Invertebratorum quæ in Expeditione ad Oceanum Pacificum Septentrionalem a Republicâ Federatâ missâ, Cadwalladere Ringgold et Johanne Rodgers ducibus, observavit et descripsit W. Stimpson, Pars Tertia," which was referred to a Committee.

Mr. Lea exhibited the plates accompanying his paper, recently presented to the Academy, on fresh water Naiades collected in Siam, &c., by Dr. House, at the suggestion of Mr. Haines and others of New York. Several of the specimens are very similar to our own species from the valley of the Ohio. A specimen from Australia much resembles the *U. Hopetonensis*, Lea, from Southern Georgia.

December 22d, 1857.

Vice President BRIDGES in the Chair.

A paper was presented for publication in the Proceedings, entitled "Observations on a Group of Fossil Shells found in Tippah Co., Miss., with descriptions of fifty-five new species," by T. A. Conrad, which was referred to a Committee.

Mr. Lea stated, in presenting a specimen to the Academy, that he had visited the locality at Braintree, 10 miles south of Boston, where specimens of large *Trilobites* have been recently found. The attention of Prof. W. B. Rogers was called, some fifteen months since, to "this unique and most interesting locality," by Peter Wainwright, Esq., residing in the neighborhood. Mr. Lea agreed entirely with Prof. Rogers in placing this formation among the more ancient of the Paleozoic periods. It lies directly on the granite rocks, or rather it is squeezed in and is embraced by these rocks, (on the east and west sides,) which are disturbed by an upheaval. The formation here is about three hundred yards wide, and lies in a south-east direction. In examination of the quarry, Mr. Lea was kindly assisted by the owner, Mr. E. Hayward, who now carefully preserves the best specimens which are brought to light. He pointed out to Mr. Lea the parts of the quarry where most of the specimens were found, and where some impressions were still remaining in place on the surfaces of the stratification. These surfaces dipped to the south 68°. The rock consists of a very hard, gray, slaty sandstone, frequently breaking into irregular cross fractures. The *Trilobite* found here is of great interest. It belongs to the genus *Paradoxides*, and is no doubt the same as described by Prof. Green many years since, under the name of *P. Harlani*, of which there is a cast in the collection of the Academy, and which, on comparison with the specimen now presented, proves to be undoubtedly identical. Barande describes and figures several species of the genus *Paradoxides* from the lower Silurian of Bohemia, which are closely allied to this, and prove conclusively that the strata must be nearly if not precisely on the same horizon.

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Dr. Hammond introduced Major Wayne, U. S. A., recently engaged in the effort to domesticate the camel in Texas. Major Wayne said :

It gives me pleasure, Mr. President and Gentlemen of the Academy of Natural Sciences, to comply with the request of my friends, and make a few remarks before you this evening, upon the experiment of introducing the Camel into America. I esteem the opportunity offered fortunate, as I desire to enlist your interests and sympathies in an undertaking possessing scientific interest, and as I believe great practical benefit, prospectively, for our country. I may not be able to add any thing to your Zoological knowledge, but I may inform you of our purposes, and hope to secure the co-operation of a society so influential and progressive as is yours.

There have been previous attempts to introduce the Camel into the Western Hemisphere, into South America, Mexico, the island of Jamaica, and according to Mr. D. J. Browne, of the Patent Office, into our own Virginia in the year 1701. Of these attempts I have not met with any clear account, either as to their origin, progress or failure. To preserve, to Zoological history, therefore, the present effort, I will premise my remarks by a brief sketch of its rise and progress.

Shortly after the close of the war with Mexico, when our territory became extended to the Pacific, the advantage of the uses of the Camel in our great interior continent suggested itself to the mind of Col. Geo. H. Crosman, of the Army, who communicated his views to myself and others. Examination of the subject induced the belief that the animal would be of great use, beyond our present means of transportation, (pack mules or wagons,) in carrying on trade and communication through our own deserts ; and that even if, with the progressive spirit of our country, the iron rail and steed should unite the two oceans, that there would be still to the North and to the South large regions to be developed, and that this most profitably and readily could be accomplished by the powers and endurance of the Camel. We saw Congress voting money freely for this or that scheme for personal or local benefit, and we thought it not unjustifiable to ask for \$30,000 for an experiment broadly national in its character, and of which the advantage, if successful, might be said to be incalculable. A bill for the purpose was introduced into Congress by the Hon. Jefferson Davis, of Mississippi, then Chairman of the Military Committee, who entered warmly into the measure, and who subsequently, as Secretary of War, brought it to a successful conclusion. From 1848 to 1855, we struggled with varying fortunes. Our contention was not with men of science. Had it been, no difficulties in the way of an early practical test would have been interposed. But it was with ignorance, prejudice and ridicule. Of the Camel, nothing was known popularly. And its only use patent to our people, was to excite wonder and merriment in our menageries. It is due, however, to the Military Committees of both the Senate and House to say, that they unwaveringly supported the measure throughout. And here let me add another tribute to that just read by your Secretary, to the memory of one whose name and contributions to science are now historical. I mean the late lamented Geo. R. Gliddon. He aided us much by his knowledge of the East, of the Camel itself, of its uses, with which he had been for many years practically acquainted in Egypt, and enabled us to place the matter in the right point of view before Congress and the Press. The experiment owes to his exertions much of its success. Without wearying you with details, suffice it to say, through the management of General Shields, of the Senate, a bill was finally passed in favor of the experiment on the 3d of March, 1855, and soon after I was sent for by the Secretary of War, and charged by him with the responsibility of conducting it.

For my first studies, my attention had been given to Africa ; but as I progressed, I found myself carried into Asia, and become satisfied that the animal would be drawn from that country with greater chances of success. Taking up Humboldt's Isothermal Lines, and studying the effects of geological structure and topographical formation upon temperature, I carried into America a system

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of Isotherms, corresponding as nearly as I could trace them, with those of Asia, and was led to believe that in Texas, somewhere, I should meet with climates similar to many of those in Asia, in which the Camel lived; and by the time the bill was passed, and indeed for two years before it, I was prepared with a digested plan, which I am happy to say was carried out without change, and so far fortunately. Nearly two years' experience with the animal on this continent has given satisfactory proof that it will live, propagate and flourish among us. In connection I would here mention, that within a few days I have heard that a fossil camel bone has been discovered in the West, and is so declared to be by one of your distinguished members, Dr. Leidy. If this be so, I adopt the fact as evidence, further, that the Camel may be domesticated among us.

Desirous of informing myself thoroughly of the difficulties in my way, and that I might be certain of having taken them all in, I visited England and France on my route to the East, for the purpose of discussing the matter there with men of science, and of profiting by their suggestions. In England I was cordially received, especially by Professor Owen, and D. W. Mitchell, Esq., Secretary of the Zoological Society, London, and met everywhere with encouragement. Prof. Owen and Mr. Mitchell expressed themselves confidently as to our success. To these two gentlemen my warmest thanks are due for facilities, encouragement and practical suggestions. In France, I did not meet with the same support. Indeed, my visit was at an unfavorable period. The sympathies of this country, with Russia in the struggle then going on, the vile abuse in certain of the papers of the Emperor and Empress, the filibustering attempts on Cuba, and our own difference in relation to the Consul at San Francisco pending at the time, created in governmental circles impressions not the most favorable to Americans; and I found so many delays interposed that the prosecution of my researches in that direction (in regard to military experience with the animal in Algeria) were discontinued. The men of science with whom I conversed, spoke doubtfully of the result; indeed, did not think I could transport so many animals, 30 to 40, across the Atlantic, and doubted if those that might be landed would live. With true French idiosyncrasy they examined the question only with regard to Algeria, and did not apparently extend their investigations to the harder races of Asia. The more I learned, the more convinced was I of the feasibility of the experiment, the only difficulty in the way being the transportation of so many animals across the sea. But on this point I was also sanguine, the Secretary of War having, at my request, committed that portion of the experiment to Lieut. Porter, of the Navy, an officer of ability, ingenuity and experience, and whose complete success fully demonstrated the propriety of the selection.

If my appreciation of the animal from reading only had been such as to induce me to give it so much time, and to risk so much of reputation, you may imagine my estimation of it when landed in the East; I saw it in use, not only sustaining, but exceeding the limits of utility within which I had restricted my expectations and my declarations. It is really a noble animal, and one of the most wonderful adaptations of the Infinite to the wants of his creatures. Provided with water, as you all know, for several days by the peculiar formation of its stomach, and with sustenance in its ungainly hump, strongly built in front for burdens, and with a protuberant eye that ensures its footing; its fitness for deserts and for an irregular, broken country, deficient in water or herbage, are palpably evident. With regard to the particular physical structure which enables it to carry a supply of water for three or four—even, in some cases, seven—days, I have not yet been satisfied. The Camel is a ruminant, and with others of that class has distinctly its four stomachs. The idea of a fifth, as has been adopted by some, I think we must discard. How, then, is the water carried? The best opinion now is, I think, that it is contained in the coatings of the first stomach, in a number of small cells, as water is held in the melon. Such is the view of General Carbreccia, who conducted the experiment with camels in the service of the French army in Algeria. And that the Camel, by muscular
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action, squeezes out a sufficient quantity to moisten its food at will. Cuvier goes further, and says the Camel has the power of secreting or creating water. How, he does not say, and we are left by his authority to our own speculations. This is one curious point for our attention, and a satisfactory report upon it would be exceedingly interesting to science.

The hump is essentially fatty, and by some, has been thought to be intimately connected with the animal's vitality. But I think this opinion erroneous. I have seen nothing myself to sustain it, and Linant de Bellefonds, known in Egypt, as Linant Bey, the Chief Civil Engineer to the Viceroy, who is particularly fond of Dromedaries, told me that he had in two or three instances opened the hump and cut out portions of the fat without apparently much pain to the animal, and certainly with no material injury to it. As I have before said, it is the animal's reservoir of food. When forage is scant, its gradual absorption sustains life and strength, and it is not until that is totally absorbed, that the muscles and stomach, as with other animals, are attacked. I have seen Camels coming in from long journeys, with their backs almost straight. In the skeleton in your Museum, there is no rise of the dorsal vertebræ. In those I have anatomized, I have invariably found a slight convexity of the upper line of the vertebræ under the hump, as it were, an arch for its support.

It was with great difficulty that we could satisfy the public mind as to the hoof of the Camel. That it was not soft and tender, but tough, and capable of travelling safely and comfortably over a fair share of stony soil. On this point, Dr. Atkinson and Mr. Farlane bear ample testimony. The former, the Surgeon General of the Cabul Expedition in 1841, I think, without speaking intentionally of the Camel, introduces him in comparison with their other means of transportation; and the Doctor speaks of its peculiar surefootedness, and that its broad, tough and yielding hoof trod securely upon the rolling cobble stones of the mountain torrents, while horses and mules slipping on them, were thrown, often to the loss of animal or load, and sometimes of both. The latter speaks particularly to the point, and says, that in his many journeys in Asia Minor, he never saw a rounded hoof. And when we recollect that almost all the trade of Asia, from the confines of Mongolia to the Mediterranean and Black Seas, and from India to Siberia, is carried through Central Asia, over countries mountainous, rugged and desert, through sand and volcanic debris, and that the animal travels in climates so far north as to range several degrees below zero, for instance—the Mountains of Media, at 25° below of centigrade, equal to 13° below of Fahrenheit, we may be satisfied that the Camel's foot is equal to any surface we shall have to expose it to on this continent, and corrects another popular impression, that the Camel is an animal of the Torrid Zone, and cannot stand cold.

There is one point to which I would especially call the attention of the Society. At my first outset I was confused by the adopted nomenclature of this class of animals established by Buffon. He calls the two-humped animal the "Camel," and the one-humped, the "Dromedary." Now this classification excludes "the Camel" from all the world but a portion of Tartary. Travelling in the East, however, we find the Arabic word "*gimel*," "*djmel*," Hebrew *garmal*, applied to both species as the generic term, and that the word *dromedary* is unknown. Examining further, we find the word *dromedary* to be a derivative from the Greek, (*δρομεως*) runners or racers, and to have been applied only to the riding or swift species of the one-humped class. For my own satisfaction, and to facilitate the clearness of my researches, I adopted the word *Camel* (Lat. *Camelus*) as generic, designating the two classes of their nativity. The two-humped I styled the Bactrian Camel, from its ancient home, Bactria, and the single-humped, the Arabian Camel, from the country of its origin in Arabia; reserving the word *dromedary* as applicable only to the riding animal of the one-humped species. Subsequently, finding these views to be entertained by Gen. E. Dumas, of the French Army, Director of, and long connected with, the affairs of Algeria, and by Linant Bey, of Egypt, I have openly adopted this

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nomenclature and classification in my official Report, and would respectfully submit it to the consideration of the Academy. The two varieties differ as the horse and ass; the product of the two being a hybrid, deficient in power for the continuance of the race, and if producing at all, giving life to a poor, undersized, worthless animal. The cross of the double-humped or Bactrian male upon the single-humped or Arabian female is known as a *Tinlu* or *Boogdee*, and is the useful animal of the caravan, uniting as it does the strength of its paternity with the quicker movements of its maternal stock. It is classed with the one-humped, though a slight rising in rear of its hump, in many instances hardly discernible, marks its double descent. These animals will lift for short distances from 1,000 to 1,500, even 1,800 pounds, and carry on journeys from 700 to 800, making from 18 to 25 miles, according to the character of the country travelled over. For the creation of this useful cross, double-humped males are kept throughout Asia as stallions are with us. I did not see a cross of a single-humped male on the double-humped female, nor did I gather anything in relation to it.

Collecting my animals principally in Asia Minor, including two Bactrians, a Tinlu or hybrid, and Arabian males and females, with a few burthen camels and dromedaries from Egypt, we started for the United States from Smyrna, on the 15th of February, 1856, and landed the Camels on the shores of Texas on the 14th of May, 1856, after an unusually rough voyage. We sailed from Asia with 33 animals on board, and landed with 34, having lost but one of the original stock embarked, and having had some births on the way. The success of the first importation induced a second; and on the 10th of February, 1857, forty-one more camels out of forty-three embarked were delivered in Texas, making in all 75 safely landed in America.

So far the results have realized our sanguine expectations. But two of the whole lot, the Bactrians, have fallen victims to acclimatory disease. The others seem to be as much at home as on their native soil, and have been used with convincing proof of their usefulness and advantage. Our ordinary means of transportation in our great inland territory are pack mules and wagons. A pack mule cannot carry on a journey, on an average, more than 150 pounds—I speak from experience with them in Mexico,—and requires a daily allowance of water. The Camel carries from 350 to 800 pounds, according to quality, and is independent of water for three or four days. The mule travels from 15 to 20 miles a day; the Camel from 18 to 25. The mule and the Camel consume about the same amount of food. If anything, the Camel can do with less. Once fed, the Camel is fed for 24 hours. Browsing as well as grazing, it picks up food where other animals would not live, and eats readily spinous plants. In the hyperbolic language of the East, the Camel finds sustenance where the eye of man cannot detect herbage. On one occasion I carried, on six Camels, 3,648 pounds, over the same road and distance travelled by wagons, and gained on them 42½ hours in time, the wagons carrying on an average only 1,800 pounds, and drawn by six mules each. This comparison was altogether accidental. Early in this year thirty-five Camels were sent with a party to the Pacific, and I am fortunate in being able to read to the Society the last report from them. Coming, as this testimony does, from a gentleman, Mr. Beale, in no way connected with the experiment of their introduction, I think it may be regarded as impartial. The Camels were attached to Mr. Beale's expedition, under a competent person, Mr. Heap, who had accompanied me on the first expedition, and purchased the animals for the second importation. Mr. Beale writes:—

(Extract.)

"King's Creek, Sept. 27, 1857, 100 miles east of the Colorado.

Hon. J. B. Floyd, Secretary of War:

Sir—I have the honor to report my arrival at this place, a creek flowing north into the Colorado. I cannot sufficiently express my admiration of that noble brute, the Camel; and I look
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forward confidently to the day when they will be found in general use in all parts of the country. The idea that their feet would break down in travelling over rocky ground is an exploded absurdity. In all the explorations, over the roughest possible volcanic rock, they have been with us, patiently packing water, of which they never drank a drop, and corn, of which they never tasted a grain. On the expedition, from which I returned yesterday, they were four days without water, and apparently without feeling the want of it.

(Signed) E. F. BEALE."

On one occasion, shortly after landing the first importation, and when carrying them up from the Coast of San Antonio, the Camels broke suddenly from the road and rushed furiously towards one spot a little distance from it. Fearful that something had gone amiss, I was hastening towards them with anxiety, when I was met by one of the Turks, holding out to me a plant, and with a face beaming with pleasure. Through the American interpreter, he informed me that it was a plant of which the Camel was particularly fond, and that they had simultaneously smelt or seen it, and rushed for it. Hence their unusual vehemence. This, as you may suppose, came cheerfully home to me. For if the land bore Camels' food, why not the Camels too? The plant was apparently of the same class as *purslane*, but though I showed some of it to various persons in Texas, I could hear nothing of its name or quality.

I have now, gentlemen, endeavored to entertain you so far with these few desultory remarks, and hope I have succeeded in enlisting your interest. I have already occupied too much of your time, and will therefore close by referring to the official Report of the Secretary, published by the Senate, for any further information in detail that you may require.

Major Wayne further, in reply to a question, stated that the cost of the Camels landed in America, including all expenses, averaged about \$105; and that the Camel bore the sea voyage better than any animals he had seen carried at sea. That on this point, they were all agreeably relieved. As soon as the vessel became uneasy, the Camels would lie down of their own accord, and so remain until the gale subsided; and that it was only necessary to secure them from chafing. That from some experience and observation of the transportation of horses and mules during the war with Mexico, he unhesitatingly said that he would rather carry 100 Camels at sea, than ten horses or mules. That one of the Camels presented to him by the Bey of Tunis, was on board nine months without leaving the ship, and that he continued in good health, and was now one of the finest of our Camels.

Dr. Leidy observed, in connection with the interesting remarks of Major Wayne, on the introduction of the Camel into North America, that he had been led by his palæontological researches to believe the experiment would prove a successful one, and he had so stated his impressions in conversation with members of the Academy. The grounds of his opinion were founded upon the following facts and inferences. The Horse existed during the pliocene period in America, in association with the Elephant, Mastodon, Ox, Deer, Bear, Peccary, Megalonyx, Lion, Capybara, Camel, &c. This fauna most probably indicates the temperature of the American continent, as then formed, to be what it is now, or nearly so. Though most of the genera mentioned became extinct in North America, the others abundantly exist, and the subsequent introduction of the Horse has been exceedingly fruitful in its results. As remains of the Camel (*Camelops Kansanus*) have been discovered in Kansas Territory, and a congener, the Lama, still exists in South America, the reasons are favorable to the introduction of the recent Camel in this country.

December 29th, 1857.

Vice-President BRIDGES in the Chair.

The Committees to whom were referred the following papers, reported in favor of publication, viz :

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"Notes on North American species of *Archibuteo* and *Lanius*, and Description of a new species of Toucan of the genus *Selenidera*, by John Cassin."

"Description of several new North American Reptiles, by E. Halliwell, M. D."

"Descriptions of Exotic Genera and Species of the Family Unionidæ, by Isaac Lea." (For the Journal.)

"Prodromus descriptionis animalium, &c., by Wm. Stimpson."

"Observations on a group of Fossil shells found in Tippah County, Miss., with descriptions of fifty-five new species, by T. A. Conrad." (For the Journal.)

Notes on the North American species of *Archibuteo* and *Lanius*, and description of a new species of Toucan, of the genus *Selenidera*, Gould.

BY JOHN CASSIN.

Genus *ARCHIBUTEO*, Brehm. Isis, 1828, p. 1269.

Of this genus there are three North American species, all of which have been misunderstood and confounded with each other in a greater or less degree by authors. Of these, the most common and best known species, *Archibuteo lagopus*, is one of the few birds of this continent which appears to be absolutely identical with the species of Europe long known by this name, the adult of which has been mistaken by American naturalists, while of the European bird the adult has apparently been unknown to British and French ornithologists, though figured and described by the Germans and others of northern Europe.

1. *ARCHIBUTEO LAGOPUS*, (Gmelin.)

Falco lagopus, Gm. Syst. Nat. i. p. 260, (1788.)

Naumann, Vog. Deuts. i. pl. 34, (adult and young;) Reichenbach, Deutschland's Fauna, Birds, pl. xiii. fig. 51, (adult;) Korner, Skandinaviska Foglar, pl. v. fig. 15, (adult;) Selby, Ill. Brit. Orn. pl. vii. (young;) Gould, B. of Eur. i. pl. 15, (young;) Wilson, Am. Orn. iv. pl. 33, (young;) Aud. B. of Am. pl. 422, fig. 2, (adult?)

Tarsus densely feathered in front to the toes, naked behind; wings long, tail rather short.

Adult. Upper parts of body pale cinereous, with partially concealed transverse bands of white and dark brown; rump dark umber brown; head yellowish white with longitudinal stripes of brown frequently tinged with pale reddish; quills dark umber brown, edged externally with ashy, and with a large space at the base of their inner webs, white, with a silky lustre. Under parts white; throat with longitudinal narrow stripes of dark brown; breast with large spots and concealed stripes of reddish brown; abdomen with numerous narrow bands of brownish black, most conspicuous on the flanks and frequently with a tinge of ashy; tibiae and tarsi barred transversely with white and dark brown, and frequently with a tinge of reddish; under tail coverts white. Upper tail coverts white at base and tipped with brownish black; tail white at base, with a wide subterminal band of black, and about two other bands of black alternating with others of light cinereous, tip ashy white, cere and toes yellow.

Young. Upper parts light umber brown, many feathers edged with yellowish white and pale reddish, which colors predominate on the head and neck in some specimens. Under parts yellowish white, with a wide transverse band of brownish black on the abdomen, and a few longitudinal lines and spots of the same color on the breast and neck. Quills ashy brown, with a large basal portion of their inner webs white; tail at its base white, with a wide subterminal band of light umber brown; tip white; tibiae and tarsi pale reddish yellow, with longitudinal stripes and spots of dark brown.

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Total length, female 21 to 23 inches, wing 16 to 17, tail 9 inches; male smaller.

Hab. All of temperate North America. Europe. Spec. in Mus. Acad. Philada.

We regard the plumage first described above as undoubtedly that of the adult of this species, though it has never been given as such by any American author. It corresponds precisely with European specimens in the Museum of this Academy, well understood by the German ornithologists to be the adult of *A. lagopus*, and figured as such in their works, of which some are cited above. In both adult and young plumage there are no characters whatever, so far as we can see, by which American and European specimens can be distinguished from each other.

Our attention was first directed to the European species, and to the fact of the adult being known to the German ornithologists, by Mr. Alfred Newton, F. L. S. of Magdalene College, Cambridge, to whom we beg leave to acknowledge our indebtedness for much valuable information derived during his late visit to the United States.

The other North American species of this genus are :

2. *ARCHIBUTEO SANCTIOHANNIS*, (Gmelin.)

Falco sanctiohannis, Gm. Syst. Nat. i. p. 273, (1788.)

Falco spadiceus, Gm. Syst. Nat. i. p. 273?

Falco niger, Wilson, Am. Orn. vi. p. 82, (1812.)

Wilson's Am. Orn. vi. pl. 53, fig. 1, 2; Aud. B. of Am. pl. 422, fig. 1, pl. 166, (young?)

In young plumage this bird considerably resembles the preceding, but is quite distinct, and generally not difficult to be distinguished. It is larger and has the under parts much more spotted in the young, while of course the clear black of the adult of the present bird is totally unlike any known plumage of the preceding. In the adult of this species, the tail is of the same black as the general plumage, with one well defined band of white. This species has not yet been observed in Western North America, though rather abundant in the Eastern and North Eastern States.

3. *ARCHIBUTEO FERRUGINEUS*, (Lichtenstein.)

Buteo ferrugineus, Licht. Trans. Acad. Berlin, 1838, p. 428.

Archibuteo regalis, G. R. Gray, Gen. Birds i. pl. 6.

Buteo californicus, Hutchins, California Magazine, March 1857.

Gray, Gen. of Birds, i. pl. 6; Cassin, B. of Cal. and Texas, 1 pl. 26.

This bird is larger than either of the preceding and quite different in every known stage of plumage. It is apparently exclusively western, and like the other species of this genus the adult and young are quite unlike each other in colors. Both are described and figured in our work cited above.

Genus *LANIUS*, Linn. Syst. Nat. i. p. 134, (1766.)

The species of this genus inhabiting the United States, though not difficult to be distinguished from each other, have been singularly confused by authors. No less than five distinct species have been mistaken for, or rather condensed into two. The North American species are as follows:

1. *LANIUS BOREALIS*, Vieillot.

Lanius borealis, Vieill. Ois. d'Am. Sept. 1, p. 80, (1807.)

Sw. and Rich. Faun. Bor. Am. Birds, pl. 33; Vieill. Ois. d'Am. Sept. pl. 50.

Larger than *L. septentrionalis*, and is the largest known species of North America. It is darker colored than that species, and is well described and figured by Swainson, as above cited, who mistakes it, however, for the bird described and figured by Wilson under the name *Lanius excubitor*, which is the species immediately succeeding.

Specimens of this bird are in the fine collection made in Washington Territory by George Suckley, M. D., a highly talented young naturalist, late of the United States Army. It appears to be a northern and Western species.

[December,

Total length (of skin) about 10 inches, (11 inches according to Swainson, as above.)

2. *LANIUS SEPTENTRIONALIS*, Gmelin.

Lanius septentrionalis, Gm. Syst. Nat. i. p. 306, (1788.)

Wilson's Am. Orn. i. pl. 5, fig. 1; Aud. B. of Am. pl. 192, oct. ed. iv. pl. 236.

Described and figured very accurately by both Wilson and Audubon, and well known as a bird of the Middle and Northern States. Total length (of skin) about 9 inches (10 inches, according to Wilson.) Mistaken by Audubon for the preceding, and this species is meant by that author in B. of Am. octavo edition, iv. p. 130, and in Synopsis of B. of N. A. p. 157, under the name of *Lanius borealis*. Wilson, in Am. Orn. i. p. 74, gives this species as "*Lanius excubitor*?" doubting its identity with the European species of that name. Audubon, in Orn. Biog. ii. p. 534, does not doubt, but gives it as identical, and says, "On comparing this bird with *Lanius excubitor* of Europe, I cannot perceive differences that could induce me for a moment to conceive them distinct." This author afterwards did perceive and states very differently in Synopsis, p. 158, where differences between this bird and *L. excubitor* are pointed out, and also in B. of Am. oct. ed. iv. p. 133. This change in perception is, however, very probably due to Mr. Macgillivray, who claims the authorship of Audubon's Synopsis (in Manual of British Ornithology, i. p. 245, London, 1840.) In allusion to *Hirundo purpurea*, Macgillivray says, "The following characters are those given by me in Mr. Audubon's Synopsis."

3. *LANIUS LUDOVICIANUS*, Linnæus.

Lanius ludovicianus, Linn. Syst. Nat. i. p. 134, (1766.)

Lanius carolinensis, Wilson, Am. Orn. iii. p. 57.

Wilson's Am. Orn. iii. pl. 22, fig. 5, Aud. B. of Am. pl. 57, oct. ed. iv. 237.

In this species the entire upper parts, including rump and upper tail coverts, are uniform in color, which is bluish cinereous, darker on the head and back. It is smaller than either of the preceding, and appears to be essentially a bird of the Southern United States.

This species is easily determined from the descriptions and figures of either Wilson or Audubon. Total length (of skin) about 8½ inches, (9 inches, according to Wilson.)

4. *LANIUS EXCUBITORIDES*, Swainson.

Lanius excubitorides, Swains. Faun. Bor. Am. Birds, p. 115, (1831.)

Swains. and Rich. Faun. Bor. Am. Birds, pl. 34.

About the size of the preceding, but lighter colored, with the rump and upper tail coverts white, and readily distinguished by the latter character. This species inhabits the Western and Northern States; being brought abundantly from California, and I have seen it also from Wisconsin. It is very handsomely figured by Swainson, as above cited, but I have never seen a specimen with the reddish or pink tinge on the under parts so clear as represented in his plate, though generally perceptible.

5. *LANIUS ELEGANS*, Swainson.

Lanius elegans, Swains. Faun. Bor. Am. Birds, p. 122, (1831.)

Lanius ardosiacus, Vieillot, Ois. d'Am. Sept. 1, p. 81, (1807?)

Vieill. Ois. d'Am. Sept. 1, pl. 51?

Quite as large as *L. septentrionalis*, and with same strong form of bill, but in colors more resembling *L. ludovicianus*. The bill is entirely black, upper parts bluish cinereous, rather dark and quite uniform; wings and tail black; primaries with their basal half white, forming a very conspicuous spot on the wing; secondaries with the basal half of their inner webs white. Outer feathers of tail tipped with white, which color increases in extent to the outermost, which are almost entirely white. Under parts white tinged with ashy. Stripe through each eye, united by a narrow line in front, black; legs and toes strong, black.

Total length about 9½ inches (9¼ inches according to Swainson.)

1857.]

This appears to be exclusively a Western and Northern species, the only specimens of which that we have ever seen are in the Museum of the Philadelphia Academy. One specimen was brought from California by Dr. Gambel.

This bird is perhaps rather larger than *L. septentrionalis*, and resembles it in robustness of organization, but in colors is more like *L. ludovicianus*. The white spot on the wing is much larger than in any other North American species of this group, and the inner webs of the secondaries are pure white, with more or less black at the ends of the feathers, and as though the white spot of the primaries was continued on the inner webs of the secondaries. All the tail feathers, except the two middle, are largely tipped with white. This bird is accurately described by Mr. Swainson as above cited.

This bird bears a greater resemblance to Vieillot's figure, referred to above, than any other species of North America.

SELENIDERA SPECTABILIS, nobis.

Belongs to the same group of species as *Selenidera piperivora*, (Linn.) Gould, Monograph of Rhamphastidæ, second edition, pl. 36, and resembling that and other species of this genus in general colors, but with the bill unusually large, and in form and colors somewhat similar to the bill of *Rhamphastos ambiguus*, Swainson, Gould's Monog. 2d ed., pl. 5, but much smaller and not so dark colored. Rather larger than *S. piperivora* or any other known species of this genus.

Colors of the upper mandible divided obliquely by a line running from below the nostril to the edge of the mandible, within about one third of its length from the tip. Upper portion and tip of upper mandible light greenish yellow, nearly pure yellow at the tip; lower portion and the entire under mandible dark fuscous green, lighter at the base. Bill at its base with an edging of black as in some species of *Rhamphastos*.

Auricular feathers light yellow, tufts on the sides deep orange yellow; tibiae dark chestnut; under tail coverts scarlet. Head, neck, breast and abdomen glossy black. Upper parts of body, wings and tail olive green, darker and tinged with bluish ashy on the tail. Quills with their outer edges tinged with yellow, and their inner edges yellowish white, which is also the color of the under wing coverts.

No crescent on the back of the neck nor tips of chestnut on the tail in the present specimen.

Total length about 15 inches, wing $5\frac{1}{2}$, tail 5, bill from the gape 4, from the nostril to tip of upper mandible $3\frac{1}{2}$ inches.

Hab.—Cocuyos de Veragua, New Grenada. Discovered by Mr. Robert W. Mitchell, of Philadelphia. Spec. in Mus. Acad. Philada.

This Toucan presents some remarkable and rather anomalous characters. Though having the yellow auriculars and large spots of this color on the sides, and in fact the usual colors of the species of the group designated *Selenidera*, it has the bill longer and colored in a manner similar to *Rhamphastos ambiguus*. In form the bill of this species more strongly resembles that of *S. piperivora* than of any other bird of this group. There is no crescent of yellow on the back of the neck, nor are the feathers of the tail tipped with chestnut, as is usual in this group. All the known species of *Selenidera* are in the Museum of this Academy. This species is rather the largest of the genus.

A single specimen of this curious bird is in a very interesting collection presented to this Academy by Mr. Robert W. Mitchell, son of its distinguished member, Professor John K. Mitchell, M. D., of the Jefferson Medical College. This collection was made in Veragua, the most northern province of New Grenada.

December,

Description of several new North American Reptiles.

BY EDWARD HALLOWELL, M. D.

Fam. SCINCIDÆ.

SAURIENS LEPIDOSAURES, D. & B.

Gen. PLESTIODON, D. & B.

PLESTIODON GUTTULATUS, nob.

Syn. Lam. prosaurus guttulatus, Hallowell. Sitgreaves' Report of Exploration of the river Zuni.

We have in the collection of the Academy three specimens of this species, the original one from New Mexico, and two from Kansas, all presented by Dr. William A. Hammond, U. S. A., to whom the Academy is greatly indebted for several valuable collections, more especially illustrating the Zoology of Kansas and Nebraska, and that of the region of the Rocky Mountains. The original specimen from New Mexico was in such a condition as to render it extremely difficult to determine its true characters; the two from Kansas, however, are in fine preservation, and enables us to present a more accurate notice of it.

Sp. Char. Color black above, scales shining; a series of white spots along the upper and lower jaw, also upon the external border of the supraocular plates; 32 rows of scales. Total length 3 inches $4\frac{1}{2}$ lines; length of tail 1 inch 9 lines.

For detailed description see Sitgreaves' Report.

Habitat. Kansas and New Mexico.

PLESTIODON MULTIVIRGATUM, nob.

Sp. Char. A small more or less quadrangular plate immediately above the freno-nasal; auricular openings circular, with several scales upon the anterior margin; back with four well-defined black vittæ, (the two median ones broader,) occupying the half, or nearly so, of the adjacent rows of scales; besides these, four other narrower black lines, each occupying the angle of a single row of scales; the interspaces between the dark colored vittæ white, with a bluish tinge; upper and lower lips white, abdomen bluish, tail white, with a yellow tinge above; 24 rows of scales.

Dimensions. Length of head 4 lines; greatest breadth $3\frac{1}{2}$; of head and body to vent 2 inch. 3 lines; of tail 2 inch. $8\frac{1}{2}$ lines; of arm 2 lines; of forearm 2; of hand to extremity of longest finger $2\frac{1}{2}$; of thigh 2 lines; of leg 2 lines; of foot to extremity of longest toe 3 lines.

Habitat. Posa Creek, 460 miles west of Fort Riley, Kansas.

One specimen presented by Dr. Hammond, U. S. A.

Gen. Remarks. In *Plestiodon obsoletum* there are 28 rows of scales.

URODELES, Dum.

URODELES TREMATODERES, D. & B.

Gen. AMBYSTOMA, Tschudi.

AMBYSTOMA MACULATUM, nob.

Sp. Char. Head large, body stout, tail ensiform, fingers and toes depressed, posterior nares of moderate size, teeth arched, in four patches, the two middle convex anteriorly, nearly in contact; color brownish above; tail maculated with black; under parts yellow. Total length $7\frac{1}{2}$ inches; tail $3\frac{1}{2}$ inches.

Habitat. New Mexico. One specimen presented by Dr. McClellan.

AMBYSTOMA BICOLOR, nob.

Sp. Char. Head large; feet very moderately depressed; tail rather thick at base, rounded above, moderately compressed; posterior nares small; teeth in

sa traight transverse row; color blackish above, sides maculated with yellow tail yellow, beak marked and spotted. Total length $5\frac{1}{2}$ inches; of tail $2\frac{1}{4}$.

Habitat. New Jersey, near Beesley's Point. One specimen presented by Mr. Saml. Ashmead. Perhaps the young of *Ambystoma tigrinum*.

Gen. Remarks. A. proserpine of Prof. Baird is clouded with brown, and *A. episcopus* dark spotted.

AMBYSTOMA FUSCUM, nob.

Sp. Char. Head large, convex, eyes large, prominent, snout rounded, nostrils small, two and a half lines apart; internal nares rather large, teeth nearly transverse, in four distinct patches, extending across the palate, behind the internal nares; fingers depressed, the first and fourth of nearly equal length, the 4th longer than the 3d; 4th toe the longest; toes slightly webbed at base, tail ensiform, of nearly same length as head, neck and body; color uniform dark brown above, with extremely minute white points scattered over the sides and more sparsely upon the body and upon the sides of the tail; Indian yellow clouded with brown beneath.

Total length 5 inch. 2 lines; tail 2 inch. 7 lines.

Habitat. Indiana. One specimen presented by Prof. King, of Hanover College.

Gen. Remarks. This animal resembles somewhat the figure of *Sal. Jeffersoniana*, Holb., but in that, beside the transverse row of teeth, there are described two longitudinal series reaching to the posterior extremity of the palate. The toes in Dr. Holbrook's animal are all remarkably long, as they are described to be by Prof. Green in *Sal. Jeffersoniana*.—*Contributions of the Maclurean Lyceum to the Arts and Sciences*, p. 4.

Prodromus descriptionis animalium evertetratorum, quæ in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwala-daro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit

W. STIMPSON.

PARS III. CRUSTACEA MAIOIDEA.

MAIIDÆ.

1. *LEPTOPUS LONGIPES*, Latr. *Maris adulti* chelopoda valida, manu inflata digitis denticulatis ad basin hiantibus, dactylo versus basin tuberculo instructo
Hab.—In portu "Hong Kong"; in fundo limoso, org. 6 vulgarissimus.

2. *DOCLEA GRACILIPES*, nov. sp. Carapax tuberculis sex in linea mediana; tribus anterioribus minutis in regione gastrica; quarto in regione genitali et quinto cardiaco, sat validis et subspiniiformibus; sexto majore in margine posteriore, spiniiformi sed non acuto, decimam partem long. corporis adequante. Margo latero-anterior dentibus quatuor armata; dente anteriore v. subhepatica quam duabus medianis majore; posteriore longiore, (sextam partem carapacis lat. adequante) spiniiformi, gracili, acuto. Superficies carapacis sat villosa; regiones branchiales et gastrica tuberculis parvulis utrinque 7-8 sub tomento celatis; declivitas postero-lateralis absque tuberculis. Rostrum paulo longius quam latum, ad dimidiam divisum. Regio pterygostomiana depressa, non cancellulata; dente parvulo inter dentem subhepaticum et hoc ad angulum anteriorem areæ buccalis. Pedes longi, graciles, minus villosi; secundi paria carapace plus duplo longiores; chelopoda parvula. Dimensiones carapacis, et rostro et spinis inclusis;—long. 0.95; lat. 1.02. *D. muricata* similis, minus vero spinosa, et pedibus longioribus.

Hab.—In Mari Sinensi prope oras insulæ "Hong Kong"; e fundo sabuloso prof. 20 org. lecta.

[December,

2. *DOCLEA CANALIFERA*, nov. sp. Corpus et membra, extremitatibus digitorum et dactylorum exceptis, supra subtusque dense et breviter tomentosa. Spinæ carapacis fere ut in *D. gracilipede*; spina laterali vero brevior, et spina posteriori gracili, acuta, decimam partem carapacis longitudinis adæquante. Regio pterygostomiana (v. afferens) valde depressa, canaliculata, margine exteriori acute elevata et longe ciliata. Pedes sat robusti; secundi paris bis longitudine carapacis breviores. Chelopoda carapace breviora et pedibus secundi paris graciliora. Long. carapacis, 1.65; lat. 1.50 poll.; rostro spinisque inclusis.

Hab.—In Mari Sinensi prope "Hong Kong"; inter Echinos e fundo limoso prof. 20 org.

4. *CHIONOCETES BERINGIANUS*, St.; Proc. Bost. Soc. Nat. Hist. vi. 83; Feb. 1857. *Paloplastus Pallasi*, Gerstaecker; Archiv für Naturgeschichte, xxii. 105, t. I. f. 1. In freto Beringiano.

5. *HYAS LATIFRONS*, nov. sp. *H. coarctato* affinis, sed corpore crassiore, antice latiore, supra minus tuberculato, angulis obtusis. Rostrum brevius, minus acutum. Fissura superior orbitæ clausa.

Hab.—In Mari Beringiano, vulgaris.

MICROPISA, nov. gen. Carapax late ovatus, paulo convexus, vix spinosus, rostro bifido, spina præorbitali sat valida. Orbita supra unifissa, subtus aperta. Oculi retractiles, non latentes. Antennæ externæ articulo primo apice externo dentigero; parte mobili aperta. Manus maris adulti digitis hiantibus, ad apices denticulatos solum contiguus. *Pisæ Syraque* affinis.

5. *MICROPISA OVATA*, nov. sp. Pubescens; carapace depressiusculo, vix longiore quam lato, dente hepatico quam dente præorbitali vix majore, et dente laterali parvulo, conico, in regione branchiali. Chelopoda maris robusti, mero dentato, manu subcompressa supra subcarinata. ♂ Carapacis long. 0.4; lat. 0.38 poll.

Hab.—Prope insulam "St. Jago" archipelagi "Cape de Verdes"; inter nulliporas e profunditate 20 org.

7. *TIARINIA CORNIGERA*, (Latreille.) Ad insulas "Amakirrima," "Loo Choo" et "Ousima" lecta.

8. *TIARINIA DEPRESSA*, nov. sp. Forma, rostro, orbitisque *T. cornigera* similis. Carapax depressus, postice canaliculo submarginali profundo; tuberculis paulo numerosis, latis et depressis. Regiones branchiales utrinque spina parva laterali, supra qua tuberculis 4—5 arcuatim dispositis; regio cardiaca tri-tuberculata; gastrica tuberculis parvulis decem. Margo posterior supra dentibus tribus, subtus quatuor parvulis ornata. Rostrum cornibus ad apices graciles paululum divergentibus et resimis. Pedes ambulatorii sat lati, compressi, supra lævi; marginibus non spinulosis, sparsim ciliatis; setis robustis, clavæformibus. ♀ Carapacis long. 0.77; lat. 0.52.

Hab.—Ad insulam "Ousima" Japoniæ Australis.

9. *TIARINIA SPINIGERA*, nov. sp. Carapax oblongus, sparsim hirsutus; regione gastrica convexa, prominentiis vix conspicuis, pæne levibus; regione cardiaca tri-tuberculata; regiones branchiales utrinque spinis acutis erectis tribus in serie transversa, exterioribus paulo majoribus et supra-marginalibus. Margo posterior supra spinis parvulis septem, mediana maxima; infra tuberculis spiniformibus minutis quinque vel septem. Superficies carapacis dimidia posteriore et lateribus tuberculis minutis acutis inter spinas obsessa. Rostrum gracile, longitudine mediocre; cornibus contiguus. Theca orbitalis saliens, compressa; dente præorbitali valde saliente acuto; postorbitali etiam sat prominente. Chelopoda mero et carpo supra paulo spinulosis. Pedes ambulatorii pæne læves. ♀ Carapacis long. 0.79; lat. 0.57 poll.

Hab.—Ad insulas "Ousima" et "Tanegasima."

10. *MICIPPA HAANI*. *Micippa thalia*, De Haan; Fauna Japonica, Crust. 98, 1857.]

pl. xxiii. f. 2. (non *Cancert.*, Herbst.) In Mari Sinensi; in fundo conchoso prof. 10—20 org.

11. *MICIPPA SPINOSA*, nov. sp. Carapax depressus, supra inequalis, confertim tuberculatus et setosus. Spinæ dorsales paucae, longæ, graciles, ad apicem obtusæ; tres in linea mediana, quarum duæ in regione gastrica, et una maxima cardiaca. Spina magna in regione branchiali, inter quam et dentem postorbitali spinæ novem ad marginem lateralem sitæ. Margo posterior spinulosa. Rostrum ad extremitatem dilatatum; angulis late rotundatis, margine crenulata; dentibus duobus medianis divergentibus. Orbita supra bifissa; fissura interiore clausa, exteriori aperta. Regiones pterygostomianæ convexæ et tuberculatæ, non setosæ. Chelopoda levissima, pallide fusca; carpo manique obsolete granulatis; apicibus digitorum nigris. Pedes ambulatorii compressi, dense pilosi; mero supra spina parvula terminali. Long. 0.75; lat. 0.59 poll.

Hab.—In portu Jacksoni Australiensi; e fundo limoso, prof. 6.

12. *MICIPPA HIRTIPES*, Dana; U. S. Exploring Exp., Crust. i. 90; pl. i. f. 3. Ad insulas "Loo Choo" et "Ousima" lecta.

13. *NAXIA DICANTHA*, De Haan, Fauna Japonica, Crustacea, pl. 96; pl. xxiv. f. 1. In Mari Sinensi vulgaris; nec non in sinu "Kagosima" Japoniæ lecta.

14. *SCYRA COMPRESSIPES*, nov. sp. Regiones minus prominentes, gastrica ampla, lata, rotundata, pæne levis; hepaticæ expansæ, tuberculo subspiniformi gerentes; branchiales spina parva acuta horizontaliter porrecta, armatæ. Rostrum lamelliforme bifidum, vix latius quam longum, cornibus subtriangulatis. Pedes graciles compressi; chelopoda mero quadricarinato, carinis tuberculatis, superiore dente uno subterminali spiniformi acuto. Pedes ambulatorii supra infraque ad angulos sparsim hirsuti; setis magnis clavatis; articulis penultimis gracillimis levibus. ♀ Carapacis long. 0.65; lat., spinis inclusis, 0.51 poll.

Hab.—In sinu "Hakodadi" insulæ "Jesso" Japoniæ; in fundo arenoso et algoso prof. 6 org.

15. *DIONE AFFINIS*, De Haan, Fauna Japonica, Crust. p. 93; pl. xxii. f. 4. Ad insulam "Ousima"; specimen unicum jun. lecta.

16. *MITHRAX SUBORBICULARIS*, nov. sp. Carapax rotundatus, vix longior quam latus; margo lateralis dentibus spiniformibus subdistantibus septem armata, dentibus duobus posticis parvulis. Regio gastrica ampla, valde convexa. Superficies tuberculis subequalibus et æquidistantibus ad 30 ornata; inter tubercula granulata. Rostrum latum brevissimum, cornibus duobus parvis triangularibus acutis. Antennæ externæ articulo primo latissimo, margine anteriore tridentata, dentibus longis spiniformibus, cornua rostri fere æquantibus. Margo orbitalis superior profunde bifissa et 4—5-dentata. Oculi crassi. Chelopoda *fœminæ* pæne lævi; pedes ambulatorii primi et secundi paris hirsuti et leviter spinulosi; tertio quartoque paris vix hirsuti. ♀ Carapacis long. 0.8; lat. 0.8 poll.

Hab.—Ad insulam "Selio" freti "Gaspar."

17. *CAMPOSCIA RETUSA*, Latr.; Milne Edwards, Hist. Nat. des Crust. 283, pl. xv. f. 15, 16. Ad insulam "Ousima."

18. *ACHÆUS JAPONICUS*, De Haan, Fauna Jap. Crust. 99, pl. xxix. f. 3. In portu "Hong Kong"; mari Sinensi.

19. *ACHÆUS LACERTOSUS*, nov. sp. Carapax triangularis, regionibus sat prominentibus, superficie lævi, spinis carente, paulo pubescente. Regio hepatica dente obtuso laminiformi parvulo, horizontaliter porrecto. Rostrum æque longum ac latum, truncatum, extremitate bilobata. Antennæ externæ parte mobili filiformi, carapacis longitudinem superante. Oculorum pedunculus lævis. Chelopoda grandia, forma fere ut in *Myctiride*, mero crassissimo; manu incurvata, digitis compressis. Pedes ambulatorii valde graciles; primi paris carapace triplo longiores; tertii quartique paris dactylo falciformi. ♂ Carapacis long. 0.385; lat. 0.325 poll.

Hab.—In portu Jacksoni Australiensi; in fundo limoso prof. 6 org.

[December,

ACHÆOPSIS, nov. gen. Carapax ovato-triangularis, convexus, spinulosus; rostrum breve, bifidum; spina præocularis acuta; oculi longi, ad carapacis latus retractiles, orbitis carentes; spina parvula postoculari. Antennæ externæ apertæ, articulo basali angustissimo curvato. Fossæ antennulariæ amplæ. Hectognathopoda eleganter granulosa vel spinulosa; mero articulo quinto ad angulum externum gerente. Chelopoda sat longa. Pedes ambulatorii graciles. Dactyli pedum sex posticorum falciformes. Abdomen in fæminis sex-articulatum. *Eurypodio Achæoque* affinis.

20. *ACHÆOPSIS SPINULOSUS*, nov. sp. Pubescentulus; spinæ carapacis parvulæ graciles, acutissimæ, pleræque laterales; tres majores in regione gastrica; quatuor in regionibus branchialibus. Chelopoda spinulosa; digitis contiguis. Pedes ambulatorii irregulariter spinulosi, et pilosi. ♀ Carapacis long. 0.36; lat. 0.28 poll.

Hab.—Ad Promontorium Bonæ Spei in sinu "Simon's Bay"; e prof. 10 org

21. *STENORYNCHUS PHALANGIUM*, Lam'k.; Edw.; Crust. i. 279. Ad insulam Madeiræ; fundo arenoso, 15 org.

22. *STENORYNCHUS FALCIFER*, nov. sp. Corpus sat altum, gracile, rotundatum minute pubescente. Carapax supra spinis duabus longis in linea mediana, una in regione gastrica, altera in regione cardiaca sita; spinis v. tuberculis acutis 4—5 parvulis quoque utrinque in lateribus. Rostrum longum, carapacis longitudinis quartam partem occupante, valde gracile, cornibus acicularibus omnino contiguis. Chelopoda *feminae* setosa et partim spinosa, mero ad apicem spina longa; carpo bispinoso; manu curvata, digitis compressis, intus denticulatis, dimidiam manus longitudinis pæne formantibus. Pedes ambulatorii graciles, mero apice spina acuta armata; dactylis pedum quatuor posticorum falciformibus. ♀ Carapacis long. 0.61; lat. 0.35; pedum ambulatoriorum primi paris long. 1.75 poll.

Hab.—Ad Promontorium Bonæ Spei, sinu "Simon's Bay"; inter algas e fundo arenoso prof. 12 org.

23. *LEPTOPODIA SAGITTARIA*, Leach; Zool. Misc. ii. pl. lxxvii; Edw. l. c. i. 27 Ad insulam Madeiræ; e prof. 30 org.

24. *PERINEA TUMIDA*, Dana; U. S. Exploring Expedition, Crust. i. 114; pl. iv. f. 1. Ad insulam "Hawaii."

25. *PUGETTIA INCISA*. *Mencethius incisus*, De Haan; Fauna Japonica, Crust. 98; pl. xxiv. f. 3. In sinu "Hakodadi" insulæ "Jesso"; fundo algoso-arenoso, 6 org.

26. *PUGETTIA QUADRIDENS*. *Mencethius quadridens*, De Haan; Fauna Japonica Crust. 97; pl. xxiv. f. 2. In portu "Simoda" Japoniæ et "Hong Kong" Sinensi sublittoralis inter fucos.

27. *MENÆTHIUS SUBSERRATUS*, Adams and White; Voy. Samarang, Crust. p. 18; pl. iv. f. 1, 2. Dana; U. S. Exploring Exp. Crust.; i. 122; pl. iv. f. 7. In portu "Hong Kong"; et ad insulas "Amakirrima" prope "Loo Choo."

28. *MENÆTHIUS DENTATUS*, nov. sp. *M. subserrato* affinis, sed dentibus laterali-bus, tuberculisque magis prominentibus. Regio cardiaca valde prominens, prope tertiam partem latitudinis carapacis occupans. Dentes præorbitales elongati, longitudinaliter porrecti. ♀ Carapacis long. 0.84; lat. 0.56 poll.

Hab.—Ad insulas "Amakirrima."

29. *MENÆTHIUS DEPRESSUS*, Dana; U. S. Exploring Expedition, Crust. i. 121. pl. iv. f. 6. Ad insulas "Loo Choo"; in sargassum, sublittoralis.

30. *ACANTHONYX DENTATUS*, Milne Edwards; Hist. Nat. des Crust. i. 343. Ad Promontorium Bonæ Spei, sinu "Simon's Bay"; fundo arenoso, org. 12.

31. *EPIALTUS PRODUCTUS*, Randall; Dana, l. c. i. 123; pl. vi. f. 2. Prope "San Francisco," California.

PARTHENOPIDÆ.

32. *EURYNOME LONGIMANA*, nov. sp. Regiones sat distinctæ, non profunde separatæ. Carapax rugosus; tuberculis rotundatis depressis, latitudine variabilibus, sæpe confluentibus. Margo lateralis dente magno triangulari post orbitam; in regionibus branchialibus dentibus parvis quatuor. Margo posterior utrinque dente parvulo tuberculiformi. Regio gastrica spinis parvis duabus et postice tuberculis confluentibus; branchiales utrinque spina parva mediana; cardiaca sat prominens, oblonga, tuberculis confluentibus. Rostrum profunde bifidum, cornibus longis, acutis, paulo divergentibus. Fissura supra-orbitalis clausa. Chelopoda maris grandia, corpore vix duplo longiora; manu subgracili, supra quadrispinosa; digitis subdeflexis. Pedes ambulatorii debiles, supra bicarinati, carinis in mero spinosis. Carapacis maris long. 0.47; lat. 0.34 poll.

Hab.—Ad Promontorium Bonæ Spei; inter Gorgonias e prof. 10 org.

33. *LAMBRUS RUGOSUS*, nov. sp. Carapax rugosus, pone oculos vix contractus; longitudine et latitudine fere æqualibus; superficie tota valde irregulari et tuberculata. Frons concava, lævis; regio gastrica parva, eminentiis tribus,—mediana posteriore, minuta, granuliformi,—et duabus lateralibus latis, granulatis. Regio branchialis elevata, tuberculis conicis ad quinque ornata, uno magno. Area postero-mediana subtriangularis, depressa, in media qua regio cardiaca granulata, paulo elevata. Margo lateralis decem-dentata; dente anteriore hepatico prominente; dentibus sequentibus parvis; dente posteriore magno, conico, elevato, utrinque ad basim denticulo instructo. Margo posterior tuberculis inconspicuis quatuor distantibus. Chelopoda longitudine mediocria, robusta, supra inequaliter dentata et tuberculata; subtus tuberculis depressis, levibus, æqualibus, subseriatis. Pedes ambulatorii læves, mero supra 2—3-spinuloso. Long. carapacis, 0.34; lat. 0.35 poll.

Hab.—Prope insulam "St. Jago" archipelagi "Cape de Verdes"; inter nulliporas ad prof. 20 org.

34. *LAMBRUS LACINIATUS*, De Haan; Fauna Japonica, Crust. p. 91., pl. xxii. f. 2, 3. In portu "Hong Kong"; vulgaris in fundo limoso prof. 5—20 org.

35. *LAMBRUS TUBERCULOSUS*, nov. sp. Carapax supra bene tuberculatus; tuberculis sub-æqualibus, confertis, depressis, granulis coronatis. Margo lateralis decem-dentata, dentibus denticulatis et granulatis, duobus posticis multo majoribus in margine postero-laterali sitis. Frons supra profunde excavata; rostro subtriangulari acuto. Chelopoda valida, marginibus spinis granulosis acute conicis (10-11 in manûs carinis) serratis; superficie intercarinali tuberculata, tuberculis granulatis, supra acutis et biseriatis, subtus minoribus obtusis 3—4-seriatis. Pedes ambulatorii debiles, supra spinis acutis obsessi. Carapacis long., 0.66; lat., 0.80 poll. *L. valido* et *laciniato* forma, longitudine chelopodorum, dentibus marginalibusque affinis; sed superficie magis tuberculata.

Hab.—Prope insulam "Hong Kong" Sinensem; in fundo conchoso-limoso, prof. 15 org.

36. *CRYPTOPODIA CONTRACTA*, nov. sp. Carapax parvus, paulo expansus, triangularis, angulis lateralibus truncatis; marginibus antero-lateralibus crenulatis, post orbitas sub-contractis et emarginatis; margine posteriore recta, obsolete crenulata. Dorsum valde convexum, area mediana et regionibus antero-lateralibus depressis, regionibus branchialibus postice valde elevatis et granulatis. Frons supra concava, rostro obtuso. Chelopoda sat longa, subtus regulariter depresso-tuberculata; manu subprismatica, crista superiore sexdentata, dentibus contiguis, mediana majore, carina exteriori granulata. Pedes ambulatorii ischio meroque subtus bicarinatis, carinis spiniigeris. Carapacis long. 0.38; lat. 0.55 poll.

Hab.—In mari Sinensi boreali, lat. bor. 23°; e fundo arenoso prof. 25 org.

37. *CRYPTOPODIA FORNICATA*, M. Edwards; Hist. Nat. des Crust. i. 362. In portu "Hong Kong"; in fundo conchoso prof. 10 org.

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38. *ÆTHRA SCRUFOSA*, M. Edwards; Hist. Nat. des Crust. i. 371. Ad insulas freti Gaspar; sublittoralis.

39. *CERATOCARCINUS ALBOLINEATUS*. *Harrovia albolineata*, Adams et White; Voy. Samarang, Crust. p. 55. pl. xii. f. 5. Carapax hexagonus; margine frontali dimidiam partem latitudinis vix superante, paullo convexa, media emarginata. Dens præorbitalis sinu e fronte discretus, et frontem non longitudinaliter superans. Margo antero-lateralis quadridentata, angulo orbitæ vix prominente incluso; dente posteriore magno, acuto. Margo postero-lateralis et posterior æquales, læves. Dorsum paullo convexum, tomentosum et versus marginem granulatum; regionibus vix distinctis; tuberculis duobus in regione gastrica, et uno in utraque regione branchiali prope dentem lateralem. Oculi retractiles. Chelopoda valida, carapace plus duplo longiores, granulata; mero supra prope basim spinoso; carpo uni-tuberculato; manu lævi. Pedes ambulatorii minute villosi. Long. carapacis, 0.35; lat. 0.44 poll.

Hab.—In portu "Hong Kong."

ONCINOPIDÆ.

40. *ONCINOPUS SUBPELLUCIDUS*, nov. sp. Corpus subpellucidum, ubique pubescente. *O. araneæ* valde affinis, diversus carapace post orbitas paullo expanso et subangulato; articulo penultimo pedum ambulatoriorum primi secundique paris graciliore et longe ciliato. A *O. Neptuno* differt articulis ultimis et penultimis pedum posticorum minoribus et gracilioribus. Long. carapacis, 0.48; lat. 0.36 poll.

Hab. In portu Jacksoni Australiensi; inter spongas e prof. 6 org.

The Recording Secretary read the following Annual Report :

REPORT OF THE RECORDING SECRETARY FOR 1857.

During the past year there have been elected forty-nine Members and two Correspondents.

Three Members have died, to wit: Dr. E. K. Kane, Mr. John A. Guex, and Mr. Thomas Biddle.

The deaths of the following Correspondents have been announced to the Academy:—Professor J. W. Bailey, of West Point; Prince Charles Lucien Bonaparte; Mr. Henry Pratten, of New Harmony, Ind.

The following Papers have been presented and ordered to be published in the Proceedings or Journal of the Academy.

By W. G. Binney, two, to wit: "Description of American Land Shells;" "Notes on American Land Shells, No. 2."

By John Cassin, three, to wit: "Catalogue of Birds collected at Cape Lopez, Western Africa, by Mr. P. B. DuChaillu in 1856, with notes and descriptions of new species;" "Catalogue of Birds, collected by P. B. DuChaillu, on the River Muni, in 1856, with descriptions of new species;" "Description of North American species of Archibutes and Lanius, and description of a new species of Toucan of the genus *Selenidera*."

By T. A. Conrad, six, to wit: "Description of three new genera, twenty-three species of middle Tertiary fossils from California, and one species from Texas;" "Descriptions of two new genera of Shells;" "Rectification of some of the generic names of American Tertiary Fossils;" "Description of a new species of *Myacites*;" "Description of a new genus of the family *Dreissericæ*."

By Joseph Barnard Davis, "On the Crania of the ancient Britons, with remarks on the people themselves."

By Charles Girard, M. D., three, to wit: "Description of some new Reptiles collected by the United States Exploring Expedition, etc., parts 3d and 4th." 1857.]

"Notice upon new genera and new species of Marine and Fresh-water Fishes of Western North America."

By Edward Hallowell, M. D., five, to wit: "Note on the collection of Reptiles from Texas, recently presented to the Academy of Natural Sciences, by Dr. A. L. Heermann;" "Description of a new genus of colubriform Serpents from California;" "Notice of a Collection of Reptiles from the Gaboon country, Western Africa, made by Dr. Henry A. Ford;" "On *Trigonophys rugiceps*;" "On the caduciate *Urodele Batrachiana*."

By F. V. Hayden, M. D., two, to wit: "Notes explanatory of a map and section illustrating the geological structure of the country bordering on the Missouri river, etc.;" "Geological notes on the Mauvaises Terres of White River."

By Theodore C. Hilgard, M. D., "Classification of the Vegetable Kingdom."

By C. R. Kennerly, "Description of a new species of *Cypselus*, etc."

By J. P. Kirtland, M. D., "On the Larva of *Thyreus Abbottii*."

By Isaac Lea, L.L.D., seven, to wit: "Descriptions of thirteen new species of *Uniones* from Georgia;" "Descriptions of twelve new species of *Naiades* from North Carolina;" "Descriptions of six new species of *Uniones* from Alabama;" "Descriptions of eight new species of *Naiades* from various parts of the United States;" "Descriptions of three new exotic species of *Naiades*;" "Descriptions of six new species of fresh water and land shells;" "Descriptions of twenty-seven new species of *Uniones* from Georgia."

By Major John LeConte, two, to wit: "On three new species of *Vespertilionidæ*;" "Observations on the Wild Turkey."

By John L. LeConte, M. D., four, to wit: "Catalogue of the species of *Bembidium* found in the United States and contiguous northern regions;" "Index to the *Buprestidæ* of the United States, described in the work of Laporte and Gory, with notes;" "Descriptions of several new Mammals from Western Africa;" "Synopsis of the species of *Clivina* and allied genera, inhabiting the United States"

By Joseph Leidy, M. D., six, to wit: "Remarks on certain extinct species of Fishes;" "Notice of remains of extinct Turtles from New Jersey, etc.;" "Notices of extinct *Vertebrata*, discovered by Dr. F. V. Hayden, etc.;" "List of extinct *Vertebrata*, the remains of which have been discovered in the region of the Missouri, with remarks on their geological age;" "Notices of extinct Fishes;" "Rectification of the references of the extinct Mammalian Genera of Nebraska."

By F. B. Meek and F. V. Hayden, M. D., "Explorations under the War Department. Descriptions of new Cretaceous and Tertiary Fossils collected by Dr. F. V. Hayden in Nebraska, etc."

By William Stimpson, two, to wit: "Prodromus descriptionis animalium evertibratorum, quæ in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit W. Stimpson, (two papers.)"

By William J. Taylor, four, to wit: "Aluminium, the progress in its manipulation;" "Investigation of the rock Guano from the islands of the Carribean Sea;" "Examination of a Nickel Meteorite from Okkibaha county, Miss.;" "Examination of Enargite from New Granada."

By Philip R. Uhler, "Contributions to the Neuropterology of the United States."

All of which is respectfully submitted by

B. HOWARD RAND, M. D.

Recording Secretary.

Nov. 30th, 1857.

The Librarian read the following Annual Report:

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LIBRARIAN'S REPORT FOR 1857.

During the present year, ending December 31st, 1857, 382 volumes and 1053 periodicals and pamphlets have been added to the Library of the Academy. The various subjects upon which these treat, and the number belonging to each subject, are shown in the following table :

SUBJECTS.	No.	SUBJECTS.	No.
General Natural History and Mammalogy,.....	34	Ethnology,.....	6
Ornithology,.....	68	Physics and Chemistry,.....	14
Entomology,.....	51	Transactions, Journals, Proceedings, Reports, &c., of Societies,.....	726
Conchology,.....	211	Voyages and Travels,.....	18
Botany,.....	44	Medicine,.....	11
Geology, Palæontology and Geography,.....	146	Biography,.....	6
Anatomy, Physiology, &c.,.....	72	Miscellaneous,.....	16
Mineralogy,.....	11		
Herpetology and Ichthyology,.....	6	Total,.....	1435

Of the above works, 73 have been contributed by authors, 71 by editors, 53 by members, correspondents and others, 208 by societies and corporations, 45 by Mr. Edward Wilson, and 985 by Dr. T. B. Wilson; making a total of 1435 additions to the Library in 1857.

Among the many valuable additions made during this year, the following may be mentioned : Memoirs and Transactions of the Royal Academy of Sciences of Berlin, from 1710 to 1850, 85 volumes, from Dr. Wilson ; Donovan's Natural History of British Insects, 16 volumes, from Mr. Ord; sixth volume of the United States Naval Astronomical Expedition to the Southern Hemisphere, from Lieut. Gilliss ; twelfth volume of the United States Exploring Expedition, from Dr. A. A. Gould ; the terrestrial air-breathing Mollusks of the United States and adjacent territories of North America, from the executors of Dr. Binney ; the Zoologist, 50 numbers ; Morris' History of British Birds, 48 numbers ; the Naturalist, 48 numbers ; Adams' Genera of Recent Mollusca, 26 numbers ; Deshayes' Description des Animaux sans Vertèbres découvertes dans le bassin de Paris ; H. Von Meyer's Fauna der Vorwelt ; Crania Britannica ; Museum Botanicum Lugduno-Batavum, &c. &c., from Dr. Wilson, and also a number of rare and valuable pamphlets upon Anatomy, Physiology and Zoology from Mr. E. Wilson.

In 1836 the Library contained about 7000 volumes ; in 1850, it had increased, as was ascertained by actual enumeration, to 12,057. During the fourteen years, from 1836 to 1850, therefore, the annual rate of increase of the Library was about 430 volumes. In 1851, 2,262 additions were made to the Library ; in 1852, 2,886 ; in 1853, 1,011 ; in 1854, 729 ; in 1855, 857 ; in 1856, 1,449 ; and in 1857, 1,435 ; making a total increase during the past seven years of 10,629. From this statement it will be seen that the average annual increase for this period is a little more than 1500 volumes, a rate of increase $3\frac{1}{2}$ times greater than that for the preceding fourteen years. In his report, laid before the Academy in 1850, my friend and predecessor, Dr. Wm. S. Zantzinger, presented a classified table of the whole number of volumes in the Library. Taking this estimate as a basis, I have constructed the following table, in which is shown not only the whole number of volumes in the Library, but also the number distributed to each of the leading divisions.

Natural Sciences,.....	5579
Anatomy and Physiology,.....	633
Voyages and Travels,.....	984
History and Geography,.....	590
Transactions, Journals, Proceedings, Reports, &c., of Societies,.....	3723
Dictionaries of Arts and Sciences,.....	586
Maps and Charts,.....	49
Chemistry and Physics,.....	462
Historical Documents of all descriptions,.....	1857
Antiquities and Fine Arts,.....	430
Miscellaneous,.....	1660

Total,.....16,553 Vols.

1857.]

In the Report above alluded to, Dr. Zantzinger estimated that the works in parts or numbers not yet completed, and pamphlets, when bound, would make about 500 volumes. Since that time the increase in periodicals and pamphlets has been over 6000. If now we regard these, when bound, as equivalent to 500 volumes, and accordingly add them to the above sum, we shall obtain for the whole Library a grand total of more than 17,000 volumes.

During the year more than 400 volumes have been bound in a substantial manner, and without cost to the Academy, the expenses having been defrayed by Dr. T. B. Wilson. Many other volumes are still in the hands of the binder.

Owing to the increase in the number of Journals, Transactions, &c., of learned societies received in exchange for the publications of the Academy, Dr. T. B. Wilson, with his accustomed liberality, has caused eight additional cases to be made and placed in the western room of the Library for the better accommodation and arrangement of the books. These cases extend in a row, like a partition, nearly across the room from north to south, dividing it into two smaller, oblong apartments, which communicate by a narrow passage, and are lighted by two windows, one at each end. In consequence of these alterations, and the increased attendance at the meetings of the Academy, the latter have, since November last, been held in the eastern room, the largest and most commodious of the three rooms containing the Library. The two northern windows of this apartment have been walled up with brick from the floor to the ceiling, so that the dangers from fire in that direction are considerably diminished. Upon the floor, and in the recesses formerly occupied by the windows, two new book-cases have been erected. Gas has also been introduced into this room. The whole cost of these alterations has been borne by Dr. Wilson.

While congratulating the members of the Academy and the lovers of science in general upon the rapid influx of valuable books and periodicals into the Library, and the increasing facilities thus offered for scientific research, I deem it not inappropriate to take this opportunity of earnestly reminding the members of the importance of using every effort still further to enlarge the bounds of the Library, protect it from injury, and increase the sphere of its utility.

J. AITKEN MAIGS, *Librarian*.

The Treasurer's Report was read and referred to the Auditors.

The Curators reported as follows :

REPORT OF THE CURATORS FOR 1857.

The Curators, in presenting their annual report, take pleasure in stating that the Museum of the Academy continues in its usual excellent condition of preservation.

The arrangement of the Museum has made considerable progress during the year now approaching its close, though much remains to be done before it shall be put in complete order.

The collections, at present nearly or completely arranged and labelled, are those of Mammals, Reptiles, Insects, Crustaceans, of Botany, of Vertebrate Fossils, of Fossil Plants, of Minerals, of Birds' Eggs, and of Human Skulls.

The collections in course of arrangement, and of which several have made considerable progress, are those of Birds, Fishes, Mollusks, and of Comparative Anatomy.

The collections of Invertebrate Fossils, Echinoderms, Zoophytes, and Sponges, remain untouched. The first of these collections indicated is a very large and important one, and strongly demands the attention of some of our members to arrange it.

During the year, Mr. W. J. Binney has nearly completed the arrangement of the Conchological cabinet. Dr. Wilson continues to arrange the collection of Birds, and Drs. Bridges and Morris have made considerable progress in the

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arrangement of the collection of Fishes. The Mammalogical cabinet has been arranged by Col. McCall and Dr. Camac; and Dr. Wilson and Mr. Schafhirt, have been engaged in arranging the Insects.

In relation to the Herbarium, Mr. E. Durand has furnished the following statement:

To the Curators.—

DEAR SIRS,—The *Herbarium Boreali-Americanum*, upon which I have been engaged for these four years, is now nearly completed. As far as it goes, it fills up more than sixty large port-folios.

In its formation, I have followed the arrangements of DeCandolle, and have just finished the order *Gramineæ*, which is the last of the *Phænogamous* plants. The number of described species therein contained, amounts to seven thousand two hundred and forty-two, of which 5994 are dicotyledonous, and 1248 monocotyledonous species. It contains, moreover, other plants, either new or as yet unpublished, which may, in all probability, raise the whole number of *phænogamous* species of this particular collection to eight thousand. When the cryptogams have been added to these, it will form a mass of not less than ten thousand North American plants, constituting one of the most complete *Herbaria* extant.

This special North American herbarium had become an essential desideratum in an Institution like ours, particularly devoted to the study of the natural wealth of the country. In times past, it was inconvenient and difficult to the student of the botany of North America, to search in the general herbarium, among a mass of forty-six thousand species from all parts of the world, for the particular native plants which he was desirous to examine. Now this work is rendered easy, and he may at once, and without trouble or interruption, examine a whole suit of American species of the same genus or of the same order.

The *Herbarium Boreali-Americanum*, as far as it reaches, has been made up from the numerous packages of specimens transmitted to the Academy of Natural Sciences from all parts of the country, and piled up, neglected, on the shelves of the Botanical room. It is highly indebted to the valuable private collections of Major LeConte, and of the late Messrs. Conrad and James Reed, and to partial invoices of Drs. Torrey, Gray, Englemann, Short and others. From my own herbarium I have selected for it more than fifteen hundred rare and frequently unique specimens of my collection, all from Texas, New Mexico, the North-Western Territories, Oregon and California. The whole number of species contained in this new botanical treasure is at least double that which is to be found scattered in our general herbarium.

I do not vouch for a complete accuracy of names; but I have performed my task to the best of my ability. If faulty in some rare instances, it remains open to correction by those who will follow me. If it possesses other defects, one is that, in many cases, it is overstocked with duplicates; but this I intend to obviate hereafter, by abstracting the superfluity, with a view to enrich the general herbarium, or to store up duplicates for exchange.

The great merit of this valuable collection of North American plants is that it possesses a large number of authentic specimens—almost all the plants of Mr. Nuttall, and many others from Messrs. Elliott, Baldwin, Pursh, Torrey, Asa Gray, Curtis, &c.

With regard, your most obedient servant,

E. DURAND.

Philadelphia, December 17th, 1857.

The donations to the different departments of the Museum for 1857 are as follows:—

Mammals.—Of these, 31 specimens of 22 species have been added to the collection; the principal donors being Dr. T. B. Wilson, Dr. W. A. Hammond, Mr. L. De Vesey, and Dr. H. A. Ford.

Birds.—Of these, 46 specimens of about 25 species have been presented, principally by Dr. Hammond, Mr. De Vesey and Mr. Slack. Several small collections, in which the number of species is not designated, have been presented by R. W. Mitchell, Capt. J. P. McCown, U. S. N., and the Smithsonian Institute.

Reptiles.—In the department of Herpetology, which is so zealously cultivated by Dr. E. Hallowell, we have received rich additions. Dr. W. A. Hammond, U. S. A., presented 480 specimens of 40 species, from Kansas Territory. 184 specimens of 30 species were presented by Drs. Wilson, Leidy, Hallowell, and Mr. Conrad. 150 specimens of 30 genera from Ceylon and the Philippines, were obtained in exchange. R. W. Mitchell presented 24 specimens of 10 species from New Granada; Mr. C. Hering, 29 specimens of 10 species from Surinam; Dr. H. A.

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Ford, 31 specimens of 13 species from Africa; Dr. A. W. King, 71 specimens of 11 species; and Major LeConte 38 specimens of 11 species. Besides the foregoing, 220 specimens of 80 species were presented, principally by Messrs. T. Swift, Boulton, Wood, Canfield, Trout, Lesquereux, and Krider, and Drs. Ruschenberger, LeConte, Jos. Wilson and Uhler.

Fishes.—Of these, Dr. Hammond presented 120 specimens, yet undetermined, from Kansas Territory. Drs. Ruschenberger and H. C. Caldwell presented 47 specimens of 40 species. 21 other specimens of 14 species were presented principally by Messrs. Slack and S. Powel, and Drs. Davidson, Kittoe and T. Dunn.

Mollusks.—Dr. H. A. Ford presented 130 specimens of 12 species from Western Africa; and Dr. Woodhouse presented 126 specimens of 23 species of Naiades from the Arkansas and its tributaries. 24 specimens of 15 species were presented principally by Dr. Ruschenberger; and a small collection was presented by Dr. Hammond.

Insects.—Of the different orders of insects the following have been presented: Coleoptera, 635 specimens of 280 species; hemiptera, 189 specimens of 90 species; orthoptera, 208 specimens of 100 species; hymenoptera, 114 specimens of 60 species; diptera, 102 specimens of 50 species; neuroptera, 19 specimens of 15 species; arachnida, 18 specimens of 7 species; and myriapoda, 5 specimens of 4 species. The principal donors are Drs. Leidy, Wilson, Hammond, LeConte, and Ruschenberger, and Messrs. W. L. Cassin and W. B. Chandler.

Crustaceans.—Mr. W. Stimpson presented 34 specimens of 15 species from the west coast of America. 65 specimens of 30 species were presented principally by Drs. Ruschenberger and Hammond, and Mr. Pease.

Annelides, Echinoderms and Zoophytes.—Dr. Ruschenberger presented 29 specimens of 14 species of echinoderms and zoophytes. Dr. Hammond presented 48 Gordii, and Mr. Ashmead 1 Nereis.

Comparative Anatomy.—Of human skulls, Dr. B. Vreeland presented 9, Dr. E. H. Abadie 6, Dr. Ruschenberger 3, and Dr. T. J. Turner 27; besides which 3 others were presented. Of skulls of other animals 22 were presented, principally by Drs. Wilson, Woodhouse, and McClellan. A fine example of the skeleton of the Camel from Tunis was presented by W. S. Vaux. Besides the foregoing, there were 4 other skeletons, and 8 miscellaneous specimens presented.

Botany.—Prof. John Torrey presented 427 specimens of western American plants; Mr. Durand presented 18 species; Dr. Jos. Wilson U. S. N. presented a collection of plants from Western Africa; and Mr. S. Ashmead presented 9 species of marine algæ. Of fungi, 997 species, prepared by Ezra Michener, were presented by this gentleman and the Rev. M. A. Curtis.

Palæontology.—Of vertebrate remains 68 specimens have been presented, principally by Drs. LeConte, Leidy, and Minturn, and Messrs. W. McClane and C. Wheatley. Of invertebrate fossils, Mr. W. Cleburne presented 250 specimens from the green sand of New Jersey, and a collection from the silurian rocks of Ohio. Dr. Leidy presented 62 triassic, eocene, pliocene and post-pliocene fossils; Prof. Holmes, 26 specimens pliocene and post-pliocene fossils; Dr. Wilson, 18 species tertiary shells from California; and Dr. Woodhouse 15 specimens of fossils. Of other specimens, 13 were presented, besides a small collection from Chili, by W. Blake. Of coal plants, Dr. R. Bennett presented 42 specimens; besides which 12 other fossil plants were presented.

Mineralogy.—Of minerals, 52 specimens were presented; the principal donors being Col. G. M. Totten, Dr. Spilman, Mr. Taylor, Dr. Woodhouse, and T. W. Yardley.

Respectfully submitted by

JOSEPH LEIDY,
Chairman of the Curators.

Dr. Rand announced the death of W. Frederick Rogers, late a member of the Academy, at Paris, on the 9th of December.

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The following officers were then elected for the ensuing year.

President,
GEORGE ORD.

Vice Presidents,
Robert Bridges, Isaac Lea.

Corresponding Secretary,
John L. LeConte.

Recording Secretary,
B. Howard Rand.

Librarian,
J. Aitken Meigs.

Treasurer,
George W. Carpenter.

Curators,
Jos. Leidy, W. S. Vaux,
Samuel Ashmead. John Cassin,

Auditors,
Jos. Jeanes, Saml. Ashmead,
W. S. Vaux.

Publication Committee,
W. S. Vaux, Robert Bridges,
Jos. Leidy, Isaac Lea,
W. S. W. Ruschenberger,

ELECTIONS IN 1857.

The following gentlemen were elected members, viz :

Jan. 27. J. Reese Fry, and Louis Fassitt, M. D.

Feb. 24. J. Ennis, E. A. Souder, A. C. Gorgas, M. D., G. K. Warren, Lt. U. S. Top. Engineers, and W. J. Taylor.

March 31. Wm. Cleburne, James Paul, M. D., P. P. Bertholet, M. D., and Gideon Scull.

April 28. Benj. V. Marsh, Alex. Wilcocks, M. D., Wm. S. Halsey, M. D., Joseph Roach, Ferdinand J. Dreer, Jas. C. McGuire, Robert Carter, M. D., and George Martin, M. D.

May 26. Edward P. Eastwick, Walter F. Atlee, M. D., J. Coates Brown, R. H. Lamborn, Emil Fischer, M. D., and David March Warren.

June 30. Daniel B. Cummins, Wm. Spillman, M. D., John C. Da Costa, Sr., John C. Da Costa, Jr., and Edward Bennett.

July 28. L. S. Pepper, M. D., J. H. Slack, A. J. Rohas, M. D., Marco A. Rojas, M. D., C. S. Wurts, M. D., and W. P. Turnbull.

Aug. 25. Richard J. Haldeman, and Louis D. Harlow, M. D.

Sept. 30. Theodore De H. Rand

Oct. 27. Edward Minturn, M. D., and Prof. E. D. Porter.

Nov. 29. H. Clay Caldwell, M. D., and Edward A. Jessup.

Dec. 29. Mayland Cuthbert, Edward N. Covey, M. D., U. S. A., K. Ryland, M. D., U. S. A.

The following gentlemen were elected Correspondents, viz :

June 30. Brig. Gen. Harney, U. S. A., and Capt. Alfred Pleasonton, U. S. A.

December,

The following letters have been received.

Jan. 6th. From the Trustees of the New York State Library, dated Albany, Dec. 27th, 1856, acknowledging the receipt of the Proceedings, vol. viii. No. 5.

13th. From the Smithsonian Institution, dated Washington, March 28th, 1856, acknowledging the receipt of Proceedings, vol. viii. No. 1, and Index to vol. vii.

From the American Antiquarian Society, dated Worcester, Mass., Jan. 7th, 1857, acknowledging the receipt of Journal, New Series, vol. iii. part 3.

20th. From Prosper Tarbé, dated Paris, Oct. 7th, 1856, transmitting specimens of fossils, and desiring exchanges.

From Dr. W. S. W. Ruschenberger, U. S. N., dated Panama, Sept. 3d, 1856, transmitting a donation of marine animals.

Feb. 3d. From S. D. Gross, M. D., dated Philadelphia Jan. 30th, 1857, acknowledging election as member.

From Sandwith Drinker, dated Hong Kong, Nov. 12th, 1856, acknowledging receipt of Proceedings of Academy, and expressing desire to contribute to the Museum.

From Rev. E. I. Lowe, dated Nottingham, England, January 7th, 1857, desiring exchanges.

From the K. L. C. Akad. der Naturforscher, dated Breslau, Oct. 31st, 1856, accompanying their publications presented this evening.

From the Académie Royale des Sciences de Stockholm, dated August 1st, 1856, accompanying donation presented this evening.

From the same, of same date, acknowledging receipt of the Proceedings, vol. vii., Nos. 2—7, and of the Journal, new series, vol. iii. part 1.

From the Smithsonian Institution, dated Washington, Jan. 29th, 1857, acknowledging receipt of Journal, new series, vol. iii. part 3.

10th. From James Ross Snowden, dated Philadelphia, Jan. 27th, 1857, accompanying a mastodon bone from New Jersey, presented at the last meeting.

From Edward Schlossberger, dated New York, Feb. 6th, 1857, transmitting a donation from Prof. Schlossberger of Tübingen, and desiring exchange.

24th. From Senkenberg. Naturf. Gesellschaft, Frankfurt-a-M., Feb. 4, 1857, acknowledging publications.

March 3d. From the American Antiquarian Society, dated Worcester, Mass., Feb. 26th, 1857.

From the Entomological Society of London, dated Dec. 3d, 1856.

From the Trustees of the British Museum, dated London, Dec. 31st, 1856.

From the British Association, dated Oxford, Dec. 6th, 1856.

From the Asiatic Society, dated Calcutta, Oct. 18th, 1856.

From the Natural History Society of Northumberland, dated New Castle-upon Tyne, Dec. 13th, 1856,—severally acknowledging the receipt of publications of the Academy.

17th. From the Naturforschende Gesellschaft in Emden, dated Oct. 2d, 1856, accompanying a donation presented this evening.

From the Linnean Society of London, dated Nov. 10th, and Nov. 25th, 1856, acknowledging the receipt of the Journal, new series vol. ii. part 4, vol. iii. parts 1 and 2; and Proceedings vol. ii. No. 2; vol. vi. Nos. 7—12; vol. vii. Nos. 1—12, and vol. viii. Nos. 1 and 2.

24th. A letter from Hon. J. K. Kane, acknowledging receipt of the resolutions adopted by the Academy upon the death of Dr. E. K. Kane, U. S. N.

31st. A letter from Louis de Vésey, dated Philadelphia, March 29th, 1857, acknowledging his election as a member of the Academy.

April 14th. From W. Cleburne, Cincinnati, O., April 8, 1857, acknowledging his election.

From Acad. of Sciences, St. Louis, Mo., April 6, 1857, transmitting publications.

From K.-K. Geol. Reichsanstalt, Wien, Nov. 29, 1856, transmitting publications.

From Kongelige Danske Vid. Selskab, Kjöbenhavn, Juni 1, 1856, acknowledging receipt of publications, and transmitting their own.

From Senkenberg. Naturf. Gesellschaft, Frankfurt-am-M., Oct. 27, 1857, transmitting publications.

April 21st. From Kön. Sächs. Gesellschaft d. Wiss. Leipsic, Sept. 15, 1856, transmitting publications.

May 5th. From Elliott Society of Nat. History, Charleston, S. C., acknowledging publications.

From Naturf. Gesellschaft, Basel, Jan. 24, 1856, acknowledging publications.

From Kön. Sächs. Gesellschaft d. W., Leipsic, Jan. 12, 1857, acknowledging publications.

From Königl. Bay. Akad. der Wiss., München, Feb. 3, 1857, acknowledging publications, and desiring missing numbers.

From Rev. J. C. Adamson, D. D., New York, April 29, 1857, asking exchange of publications, &c., with the Museum of Cape Town, Africa.

From Col. J. J. Abert, Washington, D. C., April 28, 1857, referring to a supposed new species of Mocking-bird.

May 12th. From Boston Society of Nat. History, May 4, 1857, acknowledging publications.

From Ethnological Society, London, Jan. 31, 1857, acknowledging publications.

May 19th. From Societé Royale des Sciences à Upsal, Nov. 10, 1856, transmitting publications.

From Societé Imp. des Naturalistes de Moscou, Juin 12-24th, 1856, transmitting publications.

From Königl. Bay. Akad. der Wiss., München, Feb. 4, 1857, transmitting publications.

From Königl. Böhm. Gesellschaft der Wiss., Prag, Jan. 12, 1857, transmitting publications.

From Acad. Royale des Sciences, Amsterdam, Août 27, 1856, transmitting publications.

From Würtemb. Naturw. Gesellschaft, Dec. 20, 1856, transmitting publications.

From Königl. Böhm. Gesellschaft der Wissenschaften, Prag, Jan. 12, 1857, acknowledging publications and desiring missing numbers.

From Würtemb. Naturw. Gesellschaft, Dec. 20, 1856, acknowledging publications and desiring missing numbers.

June 2d. From J. C. Brown, dated Philadelphia, June 1, 1857, acknowledging his election.

From Imperial Mineral. Society, St. Petersburg, Nov. 30, 1855, acknowledging receipt of publications, and transmitting theirs in exchange.

From Naturf. Gesellschaft in Emden, Jan. 21, 1856, acknowledging receipt of publications and transmitting their own.

From Geol. Society of London, dated Dec. 4, 1856, acknowledging publications.

From I. R. Istituto Lombardo di Scienze, Lettere ed Arti, Milano, Luglio 29, 1856.

June 9th. From E. P. Eastwick, dated June 8, 1857, acknowledging his election.

June 16th. From K. L. C. Akad. d. Naturforscher, Breslau, März 4, 1857, acknowledging publications.

From Societé Imperiale des Naturalistes, Moscou, Mars 10-22d, 1857, acknowledging publications.

From Utrecht Society of Arts and Sciences, March 30, 1857, acknowledging publications.

From K.-K. Geol. Reichsanstalt, Wien, Jan. 21, 1857, acknowledging publications and transmitting their own.

From Verein für Naturkunde in Hm. Nassau, Wiesbaden, Jan. 3, 1857, transmitting publications and desiring exchange.

June 23d. From Naturw. Verein in Hamburg, Jan. 1, 1857, acknowledging publications.

From Amer. Antiquarian Society, June 19, 1857, acknowledging publications.

July 7th. From Amer. Acad. of Arts and Sciences, Boston, July 1st, 1857, transmitting their Proceedings.

July 14th. From Naturkundige Vereeniging in Nederlandsch Indie, Batavia, April 20th, 1857, acknowledging receipt of Proceedings.

From the Sec. of Geological Survey of India, transmitting Memoirs.

July 21st. From D. R. Bennett, Woodside, Pa., July 14th, transmitting donation to Museum.

From the Heidelberg Universitätsbibliothek, Feb. 2d, 1857, acknowledging Proceedings.

From the Göttingen Universitätsbibliothek, Jan. 27th, 1857, acknowledging Proceedings.

From the Academie Royale des Sciences, Amsterdam, Jan. 5th, 1857, acknowledging publications.

From the Senckenb. Naturf. Gesellschaft, Frankfurt, A. M., Feb. 4th, 1857, acknowledging publications.

July 28th. From R. H. Lamborn, Trenton, July 20th, acknowledging his election.

From Georgic Society, Randolph, N. Y., July 18th, desiring donations.

From Wisconsin State Historical Society, desiring exchange.

August 11th. From W. Spillman, M. D., Columbus, Miss., July 28th, acknowledging his election and transmitting donation.

From L. S. Pepper, M. D., July 30th, acknowledging his election.

From the Société des Sciences Phys. et Naturelles, Zurich, Feb. 19th, 1857, acknowledging and transmitting publications.

From the Royal Society of Sciences, Göttingen, April 18th, 1857, acknowledging Proceedings.

September 1st. From the Trustees N. Y. State Library, June 22d, 1857, acknowledging publications.

From Lt. H. L. Abbott, U. S. Top. Eng., transmitting Reports on Miss. and Pacific R. R. route, vol. 2.

September 8th. From Dr. E. H. Abadie, U. S. A., of this date, transmitting donation.

From D. B. McCartee, M. D., N. Y., Sept. 3d., transmitting donation.

From Rev. J. P. Kirtland, Galena, Aug. 31st, transmitting donation.

From Stephen F. Miller, Oglethorpe, Ga., July 28d, transmitting donation.

October 6th. From l'Academie Roy. des Sciences, Lettres et Beaux Arts, Bruxelles, Jan. 15th, 1856 and Feb. 1st, 1857, acknowledging publications and desiring missing numbers.

From Carl Hering, Surinam, relating to donation.

October 13th. From Naturf. Gesellschaft in Dantzig, transmitting and acknowledging publications.

From Kaisl. Akad. der Wissenschaften, Wien, Nov. 24th, 1856 and April, 1857, acknowledging and transmitting publications.

October 20th. From J. Hare Powel, Newport, October 15th, transmitting donation to museum.

From Chas. M. Blake, Coudersport, October 12th, transmitting donation to museum.

November 3d. From Naturk. Vereeniging in Nederlandsh-Indie, Batavia, April 18th, 1857, relating to their publications.

November 10th. From Naturwiss. Verein, Hamburg, Oct. 4th, 1856, transmitting publications.

From E. Baldamus, Leipzig, Aug. 5th, 1857, desiring to exchange with Oölogists of the Academy.

December 1st. From Royal Society of Sciences, Upsal, May 19th, 1857, acknowledging publications.

From Naturf. Gesellschaft in Emden, Aug. 1st, 1857, acknowledging publications.

From Société des Sciences Naturelles, Neuchatel, Mai 7th, 1857, acknowledging publications.

From Naturhist. Verein d. Preuss. Rh. u. Westphal., April 20th, 1857, acknowledging publications.

From Acad. of Sciences, St. Louis, Mo., Nov. 17th, 1857, acknowledging publications.

From Naturhist. Verein d. Pr. Rheinl. u. Westphalens, April 20th, 1857, transmitting publications.

From Naturf. Gesellschaft in Emden, July 9th, transmitting publications.

From M. Belhomme, Metz, (Moselle.)

December 8th. From Prof. E. D. Porter, Newark, Dec. 3d, 1857, acknowledging his election.

December 22d. From Royal Society, Edinburg, Nov. 1st, 1856, acknowledging Proceedings.

DONATIONS TO MUSEUM.—1857.

Jan. 13th. Three specimens of *Diemictylis viridescens*, from Virginia. Presented by Dr. Taliafero.

Thirty-four specimens of fifteen species of Cancer, *Pachygrapsus*, *Pseudograpsus*, *Fabia*, *Hippa*, *Porcellana*, *Astacus*, *Callinassa*, *Orangon*, *Pandalus*, *Atya*, and *Gebia*, from the west coast of North America. Presented by Wm. Stimpson, Esq.

A small collection of fossil tertiary shells from Courtaignon, near Rheims, France. Offered in exchange by Prosper Tarbé.

Skull of Sioux Indian Chief. Presented by Thos. Morton, M.D.

Large specimen of fossil wood, from Antigua. Presented by Edward A. Souder, Esq.

Crystals of Bi-carbonate of Ammonia, from the Guano of the Cincha Islands. Presented by Wm. L. Mactier, Esq.

20th. A specimen of *Microps lineatus*, *Hallowell*, from the Osage country. Presented by Dr. Robley Dunglison.

A collection from the Gaboon, West Africa, containing specimens of *Tachydromus*, *Gerrhosaurus*, *Hemidactylus*, *Euprepis*; a new genus of *Scincoida*, *Oxybelis*, *Dipsas*, *Bædon*; a new genus of *Lycodontians*, *Leptophis*, *Naia*, *Vipera*, in all thirteen species, and several birds. Presented by Dr. Ford.

A collection of *Echinodermata*, *Acelephæ* and *Mollusca* in alcohol, from the Navigator Islands. Presented by Drs. W. S. W. Ruschenberger, and Henry Clay Caldwell, U. S. N.

A specimen of *Pteropus* from the same locality. The same.

February 3d. Twenty terrestrial shells, 20 *Melania*, 90 marine shells, 12 species, from Western Africa. Presented by Dr. Ford.

Twenty-nine specimens, 26 species of the genera *Chætodon*, *Pomacentrus*, *Balistes*, *Equula*, *Holocentrum*, *Diacono*, *Serranus*, *Tautoga*, *Centroprius*, *Gobius*, *Caranx*, *Echineis*, *Upeneus*, *Scarus*, *Mugil*, *Tetrodon*, *Ostracion*, *Anguilla*, *Muraena*; Harbor of Apia, Upolu, Samoan or Navigator Islands. Presented by Drs. W. S. W. Ruschenberger and Dr. H. Clay Caldwell, U. S. N.

Eight specimens, four species crustacea of the genera *Carpelius*, *Calappa*, *Panulirus*, *Palæmon*. Same locality. Presented by Dr. Ruschenberger.

Shaft of humerus of *Mastodon*, from near Pemberton, Burlington Co. N. J. Presented by James Ross Snowden.

Dr. Kane's Esquimaux dog "Toodla." Presented by Dr. E. K. Kane, U. S. N.

Bradypus tridactylus, *Hystrix dorsata*. Presented by Dr. J. Cheston Morris.

Two *Felis mitis* and skulls, one *Galictis vitata* and skull, one *Salvator meria* and skull; from Brazil. Presented by Dr. S. B. Wilson.

Mus barbarus, *Myocelidus pusillus*, young, and skull; Western Africa. Presented by Dr. Henry A. Ford.

Arctic Fox, summer pelage. Presented by Dr. J. J. Hayes.

Cairina moschata. Presented by Dr. Uhler.

10th. Several specimens of skins of *Sciurus*, from Racine, Wisconsin. Presented by P. R. Hoy, M. D.

Two hundred and fifty specimens invertebrate fossils from the cretaceous formations of Monmouth Co., N. J.; one large dental plate of *Myliobates*; several specimens of lignites and fossil amber, from the same formations. Presented by Wm. Cleburne, Esq.

Two fossil Fishes from the new red sandstone, Turner's Falls, Connecticut. Presented by Isaac Lea, Esq.

17th. Two species *Locusta*, one *Gryllus*, one *Acrydium*, two *Mantis* (3 specimens), four *Hymenoptera*, two *Diptera*, one *Hemiptera*; from Bridger's Pass. Presented by Dr. W. A. Hammond, U. S. A.

One Mantis, one Libellula, one Cicada; from Fort Riley, Kansas. Presented by Dr. Hammond, U. S. N.

One Orthoptera from Nicaragua. Presented by Dr. Woodhouse.

Two Orthoptera from Lake Superior. Presented by Dr. J. L. LeConte.

One Orthoptera from Palestine. Presented by Rev. Dr. Barclay.

A small collection of rocks from Berks Co., Penna. Presented by Dr. Peter P. Bertolet.

March 3d. Three vertebræ and three other fragments of extinct saurians, from the mesozoic formations of Chatham Co., N. C. Presented by Wm. McClane, Esq., through Jos. Jeanes, Esq.

The young of *Hystrix dorsata*, from Penn'a. Presented by Wm. S. Wood.

10th. Fine specimen of *Hystrix dorsata*, from Penn'a.; mounted by Wm. S. Wood. Presented by Dr. S. B. Wilson.

Thirty specimens, 23 species, of coal plants of the genera *Sphenophyllum*, *Lepidostrobus*, *Lepidodendron*, *Favularia*, *Sigillaria*, *Stigmaria*, *Pecopteris*, *Asterophyllites*, *Neuropteris*, *Calamites*, *Hippurites*; from the coal measures of Schuylkill Co., Pa. Presented by D. R. Bennett, Esq., through Jos. Jeanes, Esq.

17th. Two *Hesperomys Bairdii*, from Kennicott, Illinois. Presented by Robert Kennicott, Esq.

Four fragments of a large Ammonite, from Caldera, Peru. Presented by W. S. W. Ruschenberger, M. D.

Sixty-five specimens, 43 species, Orthoptera, from Delaware. Presented by T. B. Wilson, M. D.

Three specimens, one species, Orthoptera. Presented by C. Guillou, Esq.

Two specimens, one species, Orthoptera, from Key West; 10 specimens, 9 species, marine Algæ, from Key West, Florida. Presented by S. Ashmead, Esq.

One *Nereis* from Beesley's Point, N. J. Presented by C. C. Ashmead, Esq.

One *Podiceps cornutus* from Pemberton, N. J. Presented by Dr. J. P. Coleman.

Specimen of incrustation from a boiler. Presented by P. W. Sheaffer, of Pottsville.

24th. One fine specimen *Lepidodendron*, from Cambria Co., Pa. Presented by G. C. Morris, Esq.

April 7th. One Coal plant, from Lehigh Co., Pa. Presented by Dr. W. H. Uhler.

Seven skulls of Eskimos and two of Loo Choo Islanders. Presented by Dr. B. Vreeland.

May 5th. Nickel Meteorite, from Oktibbeha Co., Miss. Presented by Dr. Wm. Spillman, of Columbus, Miss.

Six specimens of Minerals, from Sussex Co., N. J., and from the Lancaster zinc mines, Pa. Presented by W. J. Taylor.

Gray Fox, from Kansas. Presented by Dr. Hammond and Mr. L. De Vesey.

Six Mammals, accompanied with skulls of the same, from Brazil. Presented by Dr. T. B. Wilson.

12th. Forty-five specimens, 16 species, Eocene, Pliocene, and Post-pliocene Fossils, from South Carolina. Presented by Dr. Leidy.

Fragments of bones and teeth of Mammalia, and teeth of Sharks, from the eocene and post-pliocene deposits of Ashley River, South Carolina. Presented by Dr. Leidy.

Fossil bones and teeth of *Dorcatherium*, *Palæomeryx*, and of a Frog, from the miocene deposits of Germany. Presented by Dr. J. L. LeConte.

Numerous Silurian Fossils, from near Cincinnati, Ohio. Two Fossil Algæ and 10 specimens of Rocks, from Minnesota. Presented by Wm. Cleburne, Esq.

A small collection of Minerals and Fossils. Presented by Dr. I. Hays.

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Six specimens Fossil Helix and bones of *Cervus virginianus*, from 25 feet less in the valley of the Vermilion, Illinois. Presented by J. W. Foster, Esq.

One large Catfish and one large White Perch, from Mississippi River. Presented by Dr. E. D. Kittoe, of Galena.

Specimens of Cottonwood and Chips cut by the Beaver, from the Missouri River. Presented by Edward Harris, Esq.

Six specimens *Anolius*, 7 Ameiva, 10 Iguana, from St. Thomas, W. I. Presented by Mr. Swift.

19th. Four *Tropidonotus*, from Fort Delaware. Four Skulls of *Canis*, from New Mexico and Red Fork of Arkansas. Three fine specimens of Opal, from Honduras. Malachite and Sulphuret of Copper, from North Carolina. One hundred and twenty-six specimens, 23 species, *Unio*, *Anodon*, and *Margaritina*, collected on the tributaries of the Arkansas River. Presented by Dr. S. W. Woodhouse.

June 2d. Ten specimens Fossil Fishes, *Mecolepis*, *Elonichthys*, and *Diplodus*, from the coal field of Linton, Jefferson Co., Ohio. Presented by C. M. Wheatley.

Two Fossil Plants, from Mary's Point, Bay of Fundy. Presented by Wm. Struthers.

Helix plicata; *Neretina*; *Fulgur*, 3 Orthoptera, 3 sp.; 6 Coleoptera, 6 sp.; 7 Scorpions, 1 sp.; 3 *Polydermus*, 2 sp.; *Synbranchus*; *Carapus trachinus*; from New Granada, Presented by R. W. Mitchell.

One *Blennius*, 1 *Gunellus*, from Puget Sound. Presented by R. Davidson.

A fine specimen of the Skeleton of the Camel, from Tunis, Africa. Presented by Wm. S. Vaux.

9th. Forty-two specimens *Plestiodon*, *Anolius*, *Crotalophorus*, *Tropidonotus*, *Plethodon*, *Hyla*, and *Acris*, from South Carolina. Presented by Drs. Hallowell and Leidy.

Thirty-eight specimens *Lygosoma*, *Ophisaurus*, *Simotes*, *Rana*, *Cystignathus*, *Hyla*, *Acris*, *Engystoma*, *Plethodon*, *Ambystoma*, *Siren*. Presented by Major J. LeConte.

Twenty-nine specimens *Emys*, *Kinosternon*, *Crocodylus*, Ameiva, *Helicops*, *Calopisura*, *Herpetodryas*, *Elaphis*, *Bufo*, from Surinam. By Mr. Chas. Herring. One *Euprepes*, from Upolu, Navigator Islands. Presented by Dr. Ruschenberger.

One *Menobranchus*, from the Wabash River. Presented by Dr. Blackwood.

Two specimens *Tropidonotus* and *Gerrhonotus*, from Admiralty Inlet and Puget Sound. Presented by Geo. Davidson.

One *Rana*. Dr. Uhler. Three *Ambystoma*, from New Jersey. C. Ashmead.

Twenty-four specimens *Anolius*, *Draconura*, *Bothrops*, *Elaps*, *Oxybelis*, *Leptophis*, &c., from Cocuyas de Veraguas, N. Grenada. Presented by R. Walsh Mitchell.

One hundred and fifty specimens *Draco*, *Calotes*, *Bronchocela*, *Trigonocephalus*, *Bothrops*, *Hydrophis*, *Lycodon*, *Tropidonotus*, *Rhinophis*, *Oligodon*, *Aspidura*, *Calamaria*, *Dendrophis*, *Herpetodryas*, *Leptophis*, &c., from Ceylon and the Philippine Islands. In exchange from Mr. Cuming.

Twenty-three specimens Iguana, *Aneluis*, Ameiva, from St. Thomas, W. I. Presented by Mr. Swift.

One *Anolius equestris*, from Cuba. Presented by Maj. LeConte.

Twelve specimens *Posidonia* Shales and Coprolites, and a Fossil Fish Jaw, from the Triassic rocks of Black Rock Tunnel near Phoenixville, Chester Co., Pa. Presented by T. Conrad and Jos. Leidy.

Magnetic Iron Ore, from Danbury, N. C. Presented by R. D. Golding.

Three specimens Sulphuret of Iron, from Isle of Wight. Presented by J. Lambert.

One *Chamaeleo*, from Tunis. Presented by W. P. Chandler.

16th. *Alosa sapidissima*. Presented by Dr. J. C. Morris.

Four hundred and twenty-seven specimens of Plants collected by Dr. J. M. Bigelow in Lieut. A. W. Whipple's Expedition for a Railway route from the Mississippi River to the Pacific Ocean, near the 35° parallel of latitude. Presented by Prof. John Torrey.

A collection of Plants from the West Coast of Africa, between Madeira and the Equator. Presented by Jos. Wilson, Jr., M.D., U.S.N.

One *Recurvirostra*; 1 *Sturnus*; 1 *Coturnix*; Skull of the Camel; from Tunis. Presented by Wm. S. Vaux.

Aquila canadensis. Presented by Mrs. David Ross, Louisville, Ky.

Two Wolf Skins; 25 Bird Skins; 1 Bird's Nest; from Fort Riley, Kansas. Presented by Dr. Hammond and L. D. Vesey.

Two Skulls of Thugs, from Bengal. Presented by John Biddle, Esq.

Mummied Cat, from Thebes. Mummied Ibis, from Sakkara. Mummied Child, together with *Sarcophagus*, from Thebes. Mummy Shawl, from Thebes. Presented by J. H. Slack, Esq.

Iguana tuberculata, from Barbadees. Presented by Dr. Rand.

Jaws of *Galeocerdo arcticus*, from Delaware Bay. Presented by Wm. J. Bates.

Three fragments of rock with Reptilian remains, from Gwynedd, Pa. Presented by Jos. Leidy.

Jaws of an Otter, from New Jersey. Presented by Mr. Ashmead.

One *Herpetodryas*, from Pennsylvania. Presented by A. H. Smith.

Young of the Wild Boar of Europe. Presented by Prince Max. de Wied.

23d. Fragments of Shale with Fossil Cypris and Fish Scales, from Gwynedd, Pa. Presented by Joseph Leidy.

Fruit of *Fevillea javilla*, from New Grenada. Presented by J. Cheston Morris.

One *Platydictylus*, from Tunis. Presented by J. P. Chandler, Esq.

One *Trionyx*, 1 *Crotaphytus*, 1 *Elaphis*, 2 *Pituophis*, 1 *Ablabes*, 1 *Bufo*, 1 *Ambystoma*, from Kansas. Presented by Dr. Hammond, U. S. A.

Microps lineatus, from Osage country. Presented by Dr. R. Dunglison.

One *Boa*, 1 *Herpetodryas*, 1 *Elaps*, 1 *Xenodon*, 3 *Ameivas*, 2 *Cnemidophorus*, from Lagaira. Presented by W. G. Bolton, Esq., through Dr. J. C. Morris.

3 *Helix melanostoma*, from Tunis. Presented by W. P. Chandler, Esq.

July 7th. Large specimen of *Chlorastrolite*, from Isle Royal, Lake Superior. Presented by J. F. Blandy.

Slab of *Chyastolite*, from White Mts., New Hampshire. Presented by Dr. LeConte and I. Lea.

Eighteen species Tertiary Fossil Shells, &c. of the genera *Ostrea*, *Pallium*, *Janira*, *Axinia*, *Arcopagia*, *Mactra*, *Cyclas*, *Orepidula*, *Arca*, *Cryptomya*, *Astro-dapsis*, and *Tamiosoma*, from California. Presented by Dr. T. B. Wilson.

Five species recent Shells, from California. Presented by Dr. T. B. Wilson.

14th. Fifteen specimens of Reptiles, viz.: 1 *Boa*, 1 *Crotalus*, 1 *Bothrops*, 1 *Trigonocephalus*, 2 *Liophis*, 2 *Leptophis* from Surinam, 2 *Bufo*, 1 *Rana*, and 4 *Hylas* from the United States. Presented by C. Wood.

21st. Collection of Fossils from the first Anthracite Coal field. Presented by D. R. Bennett.

Specimen of Bituminous Coal, from Westmoreland Co., Pa. Presented by D. M. Laughlin.

Specimen of Crystallized Lead. Presented by Dr. W. M. Uhler.

Crystals of Sulphur deposited from solution. Presented by Dr. W. M. Uhler.

August 18th. Eighteen specimens, 17 species *Serranus*, *Trigla*, *Hippocampus*, *Chaetodon*, *Ephippus*, *Vomer*, *Hemiramphus*, *Siluria*, *Tetradon*, *Diodon*, *Squalus*, *Muraena*. 11 specimens, 9 species *Calappa*, *Nautilograpsus*, *Grapsus*, *Gecarcinus*, *Pagurus*, *Balanus*, *Asterias*, *Echinus*, from Panama. Presented by Dr. Ruschenberger.

Ninety-six specimens, 13 species *Tropidonotus*, *Heterodon*, *Rana*, *Hyla*, *Bufo*, *Plethodon*, *Diemictylus*, *Hylodes*, &c., from the Allegheny Mountains of western Pennsylvania. Presented by Drs. Wilson and Leidy and Mr. Conrad.

Five specimens, *Iguana*, *Xiphosoma*, *Liophis*, *Elaps*, from Panama. Presented by Dr. Ruschenberger.

Twenty-one specimens *Ambystoma*, *Plethodon*, *Hyla*, *Diemictylus*, from Newark, Delaware. Presented by Dr. T. B. Wilson.

Ten specimens *Leptophis*, *Elaps*, *Bufo*, from Omoa, Honduras. Presented by Dr. John L. LeConte.

Bones and skull of the two-toed sloth, and skull of the black Howling Monkey, from Darien, New Grenada. Presented by H. C. Caldwell, M. D., U. S. N.

September 1st. Twenty-six specimens, 7 species shells and 1 Echinoderm, from the pliocene and post-pliocene formations of South Carolina. Presented by Prof. F. S. Holmes.

Nineteen specimens, 8 species Orthoptera, 15 specimens, 11 species Neuroptera, 48 specimens 27 species Hemiptera, 38 specimens 28 species Hymenoptera, 84 specimens 51 species Diptera, from Western Pennsylvania. Presented by Drs. Leidy and Wilson and Mr. Conrad.

Thirty-six specimens 10 species Coleoptera, 32 specimens, 7 species Orthoptera, 3 specimens, 2 species Hemiptera, 9 specimens, 2 species Hymenoptera. Presented by Eugene Sharpless and Wm. L. Cassin.

Corvus cornix, *Upupa epops*, *Ceryle bicincta*, *Ardea russata*, *Charadrius spinosa*, *Querquedula crecca* and *Merops*, from Egypt and Nubia. Presented by Mr. John H. Slack.

Collection of Human Crania twenty-seven in number, from Arica, Paracas Bay, near Pisco, Puget's Sound, Bhering's Straits, Tahiti, Honolulu, Oahu, &c. Deposited by Dr. Thos. J. Turner, U. S. N.

Fragment of Human Skull with remarkable occipital flattening, found in a cave near Jerusalem, and presented by J. Judson Barclay.

Stk. Eleven specimens *Pimelodus*, *Pomotis*, *Leuciscus*, *Catastomus*, 6 species, from New Jersey. Presented by J. H. Slack.

Unio Boykinianus, Lea, from Flint River, Georgia. Presented by S. F. Miller, Esq.

Specimens Lava, from Hawaii, Feb. 1856. Coral, from Panama Bay, 3 *Mytilus*, from Arica, Peru. 1 Large Pinna, from Panama Bay. Presented by Dr. Ruschenberger.

One Spectrum, from Houston, Texas. Presented by J. Boyd Elliot.

One Alligator, from South Carolina. Presented by Dr. Leidy.

One *Plethodon*, from Pennsylvania. Presented by Mr. Jeanes.

Two *Carphophis*, 2 *Plestiodon*, 1 *Tropidonotus*, from Virginia. Presented by Mr. Krider, Jr.

Twelve larvae of *Pseudotriton ruber*, from New Jersey. Presented by F. Canfield.

One living *Coryphodon*, from Ohio. Presented by Prof. Kirtland.

Two *Bufo*, Mr. Cassin; 1 *Hylodes*, 2 *Bufo*, 1 *Plestiodon*, 7 *Hylocoetus feriarum*, Drs. Leidy and Wilson, 2 *Menobanchus lateralis*, from Portage Lake. Presented by B. Hoopes, Esq.

Three ancient Peruvian skulls, from Arica. Presented by Dr. Ruschenberger.

Seven specimens, 3 species Star fishes and 1 *Echinus*, from Upolu, Samoa. 2 Star fishes, from Panama Bay. Jaws of a fish, from Arica. Presented by Dr. Ruschenberger.

Six human crania from New Mexico. Presented by Dr. E. H. Abadie, U. S. A.

Eighteen new species of Appenine plants from Prof. Senore, of Naples. Presented by E. Durand.

One *Copris*, from Upper Egypt. Presented by J. H. Slack.

15th. *Scops portoricensis*, from the Island of St. Thomas, West Indies. Presented by Mr. Robert Swift.

A collection of birds from the province of Varagua, New Grenada. Presented by Mr. Robert W. Mitchell.

A small collection of birds from Nicaragua, and three species of Humming Birds from New Grenada. Presented by the Smithsonian Institution.

Lepus palustris, from Georgia, and *Lepus americanus*, from New York. Presented by the Smithsonian Institution.

Four hundred and forty-five specimens, 232 species Coleopterous insects of the Middle States. Presented by Dr. Joseph Leidy.

Six specimens Sulphate of Lime, and 1 Cray-fish, from Mammoth Cave, Kentucky. Presented by Samuel Hazard, Jr.

22nd. Seven specimens silver ores from Peru. Presented by Col. G. M. Totten, of Aspinwall, through Dr. Ruschenberger.

Seven specimens copper ores, from Coro Coro, Bolivia. Presented by the same.

Thirteen specimens, 2 species fossils, from Rio Pecos, Texas; 3 subcarboniferous fossils, from Illinois River, Illinois; Skulls of *Sciurus Aberti*, Woodhouse, and *Dipodomys Ordii*, Woodhouse; *Zonotricha pileata* or *Fringilla Mortoni*, the original specimen from Dr. Townsend's collection. Presented by Dr. S. W. Woodhouse.

October 6th. A collection of birds collected at Ringgold Barracks, Texas. Presented by Capt. John P. McCown, U. S. Army.

Sturnella ludoviciana, Common Lark, curious variety, with the entire under parts black instead of yellow, from Haddonfield, New Jersey. Presented by Mr. B. B. Willis.

Collection of Daguerreotypes—views of places in the vicinity of Manilla, and portraits of the native people. Presented by Mr. W. W. Wood, of Manilla.

Volcanic scoria, from Tuscany. *Tinnunculus alaudarius*, from Egypt. Presented by Mr. J. H. Slack.

Corvus ossifragus, from River Delaware, near Chester. Presented by Mr. Wm. S. Wood.

Fine specimen native copper, from Portage mine, Lake Superior. Presented by H. Denckla, Esq., through Dr. Weir.

Three cretaceous fossils, from Tennessee. Presented by Edwin Lehman, Esq.

Two skulls of the four-horned variety of the domestic sheep. 1 Siredon. 1 Ambystoma, from New Mexico. Presented by Dr. J. H. B. McClellan.

One *Carphophus*, 1 *Ablabes*, from New Jersey. Presented by Mr. Tiffany.

One *Ambystoma*, from New Jersey. Presented by Mr. Ashmead.

Two *Rana*, 2 *Lygosoma*, 2 *Menopoma*, 2 *Tropidonotus*, 1 *Herpetodryas*. 1 *Ablabes*, from Maryland. Presented by J. C. Front, M. D.

One *Plestiodon*, 1 *Nerodia*, 1 *Tropidonotus*, 2 *Ablabes*, 2 *Ambystoma*, 5 *Diemyctylus*, from Columbus, Ohio. Presented by Leo Lesquereux.

One *Rana*, from Sandusky, Ohio. Presented by Dr. J. J. Hayes.

One Alligator, 1 *Cnemidophorus*, 1 *Periops*, 1 *Heterodon*, 1 *Cnemidophorus*, 1 *Tropidonotus*, 1 *Heterodon*, 1 *Platurus*, 2 *Bothrops*, 1 *Elaps*, 1 *Crotalus*. Presented by Dr. Joseph Wilson, U. S. N.

Two *Tropidonotus*, from New Jersey. Presented by W. G. Binney.

One *Kinosternon*, 2 *Coryphodon*, 6 *Hyla*, 1 *Herpetodryas*, 1 *Iechognathus*, 1 *Tropidonotus*, 1 *Ophisaurus*, 1 *Rana*, 3 *Bufo*, 1 *Crotalus*, 1 *Coronella*, 1 *Liophis*, 2 *Chamaeleo*. Presented by T. B. Wilson.

Fourteen *Plethodon*, 2 *Spelerpes*, 2 *Rana*, from Philadelphia. Presented by Dr. Uhler.

Two *Spelerpes*, 1 *Plethodon*, 1 *Ambystoma*, 1 *Diemyctylus*, from Ohio. Presented by S. M. Luther.

One large *Balanus*. Presented by W. P. Foulke.

Specimens of Reptiles, Fishes, &c., collected in Kansas Territory. Presented by Dr. W. A. Hammond, U. S. A. Reptiles:—5 specimens *Plestiodon*, 1 species.

19 Bufo, 2; 2 Cnemidophorus; 9 Crotalus; 1 Ophisaurus; 3 Nerodia; 22 Rana, 2; 15 Heterodon; 5 Pituophis; 4 Emys; 1 Cistudo; 9 Bascanion; 67 Eutainia, 4; 86 Holbrookia; 2 Chlorosoma; 2 Ambystoma; 37 Phrynosoma; 37 Eugystoma; 59 Siredon; 1 Crotalophorus. *Fishes*:—123 specimens, undetermined. *Astaci*:—24 specimens.

October 20th. 100 Coleoptera, 15 species; 29 Orthoptera, 8; 6 Hymenoptera 3: 1 Hemiptera, from Pennsylvania. Presented by Wm. L. Cassin.

Ten Coleoptera, 9; 12 Orthoptera, 6; 9 Aptera, 4; from Tunis, Africa. Presented by W. P. Chandler.

Thirty-six Coleoptera, 9; 2 Orthoptera, 2; 25 Hymenoptera, 2; 8 Hemiptera, 4; from the Middle States. Presented by Dr. J. L. LeConte.

Nine Orthoptera, 1, from Mammoth Cave, Kentucky. Presented by Dr. J. L. LeConte.

Three Orthoptera, 3; 1 Hemiptera, from Columbia River, Oregon. Presented by Dr. J. L. LeConte.

Two Coleoptera, 2; 3 Orthoptera, 3; 2 Neuroptera, 1; 8 Hymenoptera, 8; 7 Hemiptera, 5; 2 Diptera 2. Presented by Dr. J. L. LeConte.

2 Hymenoptera, 1; 5 Hemiptera, 5; from Panama. Presented by Dr. W. S. W. Ruschenberger.

Four Orthoptera, 3; from Honduras. Presented by E. G. Squier.

Five Hymenoptera, 5; 1 Hemiptera, 1 Diptera, from Bridger's Pacific Expedition. Presented by Dr. W. A. Hammond, U. S. A.

One Hemiptera, from Kansas. 1 Orthoptera, from the Rocky Mountains. Presented by Dr. W. A. Hammond, U. S. A.

One Falco, from Upper Egypt. Presented by Mr. J. H. Slack.

Nest of Icterus spurius. Presented by Mr. Elliot.

Young of Anas sponsa, from Rhode Island. Presented by J. H. Powell.

November 3rd. Vespertilio californicus. Presented by Dr. McClellan.

Quartz and chalcidony pebbles, from Lower Egypt. Presented by J. H. Slack.

10th. One large Tridacna and an Echinus, from Navigator Islands. Presented by Dr. W. S. W. Ruschenberger.

Two fossil shells and 1 fragment of fossil wood, from Maryland. 1 Herpetodryas, 1 Coronella, 2 Tropidonotus. Presented by Dr. J. L. Burt, U. S. N.

One Trionyx, 1 Cistudo, 4 Tropidonotus, 1 Ablabes, 2 Coronella, 2 Hyla, 5 Ambystoma 3 species, 23 Plethodon, 6 Bufo and 26 larvæ, of do. Presented by Prof. A. W. King, of Hanover College, Indiana.

Thirty-two Phrynosoma, 3 Holbrookia, 2 Coryphodon, 21 Tropidonotus, 9 Crotalus, 6 Heterodon, 2 Bufo, 1 Ambystoma, from Kansas. Presented by Dr. Wm. A. Hammond, U. S. A.

17th. Seven hundred and ninety six species fungi (finely mounted specimens.) Presented by Rev. M. A. Curtis.

Two hundred and one species fungi (finely mounted specimens.) Presented by Ezra Michener, who prepared all the specimens.

Baculites ovatus, from Crosswicks, New Jersey. Presented by J. H. Slack.

Tympanic bone of a right whale, killed in Narragansett Bay. Presented by Dr. Theodore C. Dunn, of Newport.

Epeira and Cocoons, from Rhode Island. Mr. S. Powell.

December 1st. Fragment of a jaw with teeth of Crocodilus clavirostris, from Green Sand, New Jersey. Presented by R. J. Burt, Esq., through Dr. Burt.

One Centiped, from Acapulco. Presented by Mr. Powell.

One Centiped, from Kansas. Presented by Dr. W. A. Hammond.

A small collection of shells. Presented by Dr. W. A. Hammond.

Numerous specimens of a large species of Gordius, from Kansas. Presented by Dr. W. A. Hammond.

Specimens of the larva of an Oestrus from a pouched rat, from the Rocky Mountains. Presented by Dr. W. A. Hammond.

Forty-two specimens *Rana halecina*, from South Carolina. In exchange. 1 *Phrynosoma orbiculare*, from New Mexico. Presented by W. H. Davis, Esq.

One *Coronella*, from Texas. Presented by Capt. J. B. McCown, U. S. A.

Calappa decora, from Beaufort, South Carolina. Presented by S. W. Mitchell, M. D.

Scomberesox Storsi, *Lumpus anglorum*, *Hemitripterus americanus*, from Newport, Rhode Island. Presented by Dr. Thomas Dunn.

One *Gunnelus vulgaris*, from Newport. Presented by Mr. S. Powel.

Eighteen specimens, 11 species of the genera *Remipes*, *Calappa*, *Huenia*, *Macrophthalmus*, *Goniograpsus*, *Etisus*, *Atergatis*, *Actæodes*, *Pseudosquilla*, from Sandwich Islands. Presented by Mr. Pease.

One specimen Neuroptera, 5 Orthoptera 6 specimens, 48 Hemiptera 113 specimens, 13 Hymenoptera 15 specimens, 6 Diptera 8 specimens, 1 Arachnida, from the Middle States. Presented by Dr. J. Leidy.

Two Orthoptera, 2 Hymenoptera 5 specimens, from Newport, Rhode Island. Presented by S. Powel, Esq.

One Diptera, 1 Hemiptera, 3 specimens, from Kansas. Presented by Dr. W. A. Hammond.

8th. Three large specimens of crystallized quartz, curiously encrusted with talc, from Pottsville, Pa. Presented by T. W. Yardley.

Large fragment of fossil wood, from interior of China. Presented by Dr. McCartee, of Ningpo.

Fragments of fossil wood and turtle bones from the tertiary, from Beaufort, South Carolina. Presented by Mr. R. W. Gibbes.

A small collection of fossils, tertiary, and carboniferous, from the coast of Chili. Presented by Charles W. Blake.

Jaw of *Edaphodon*, from Green Sand, Camden county, New Jersey. Presented by Edward Harris, Esq.

15th. 4 specimens, 2 species fossil fishes, from Eocene, of Mississippi. 1 fossil crustacean, from Eocene, of Mississippi. Presented by Dr. Edward Minturn.

22nd. 1 *Pituophis melanoleucus*, from New Jersey. 1 Fish. Fragments of curiously fissured limestone, from Burlington county, New Jersey. Presented by S. C. Thornton, Jr., through Edward Harris, Esq.

Specimens of *Falco polyagrus*, Cassin, from Rock Island county, Illinois, the first specimen ever obtained east of the Rocky Mountains. Presented by Mr. J. Dickinson Sergeant.

Two specimens of *Arvicola*, and one specimen of *Perognathus*, from Chester county, Pennsylvania. Presented by Mr. Joseph Watson.

Seven specimens of birds from California, and one specimen from Georgia, Presented by Mr. George Davidson, U. S. Coast Survey.

Collection of 52 specimens of Birds, from Singapore. Presented by George Suckley, M. D., late U. S. Army.

DONATIONS TO LIBRARY—1857.

January 6th. Report on the present state of our knowledge of Linguistic Ethnology. By Prof. S. S. Haldeman. From the Author.

Monographie des Guêpes Solitaires, &c. Par H. F. de Saussure, cahier 2e. From the Author.

Monographie des Guêpes Sociales, &c. Par H. de Saussure, cah. 3, 4, 5. From the Author.

Proceedings of the Boston Society of Natural History, Vol. VI. 3, and title page and index of Vol. V. From the Society.

Proceedings of the Elliott Society, Jan., 1856. From the Society.

Twenty-eighth Annual Report of the Natural History Society of Montreal. From the Society.

Sixth Annual Report of the Geological Survey of Pennsylvania. By Henry D. Rogers. Harrisburg, 1852. From S. F. Baird.

The Arterial Circulation; its Physiology and chief Pathological Relations. By H. Hartshorne, M. D. Philada., 1856. From the Author.

A Discourse on the Tendencies of Modern Science. From the same.

Geological Report of the Midland Counties of North Carolina. By Ebenezer Emmons. New York, 1856. From the Author.

Le Terrain Carbonifère dans l'Amerique du Nord. Résumé explicatif d'une carte Géologique des Etats-Unis et des Provinces Anglaises de l'Amerique du Nord, &c. Cours de Géologie Paléontologique; Leçon d'ouverture. Esquisse d'une classification des chaines de Montagnes d'une partie de l'Amerique du Nord. Über die Geologie der Vereinigten Staaten und der Britischen Provinzen von Nord-Amerika. By Jules Marcou. From the Author.

Rapport sur un Mémoire de M. Jules Marcou, relatif à la classification des chaines de Montagnes d'une partie de l'Amerique du Nord. From M. Marcou.

Geografia de la Isla de Cuba. Por Felipe Poey. Habana, 1856. From the Author.

Apertura del Año Academico de 1856 a 57 en la Real Universidad Literaria de la Habana. Habana, 1856.

The following were presented by Dr. T. B. Wilson on the usual conditions:

Journal of the Franklin Institute. Dec., 1856.

Bulletin de la Société Impériale Zoologique d'Acclimatation. T. 3, No. 11.

Revue et Magasin de Zoologie, 1856, No. 11.

Aménités Malacologiques. Par J. R. Bourguignat. T. 1. Paris, 1856.

Comptes Rendus, T. 43, Nos. 15, 16, 17, 18.

Wanderungen durch die mittel-amerikanischen Freistaaten Nicaragua, Honduras und San Salvador. Von Dr. O. Scherzer. Braunschweig, 1857.

Die Lehre von den Flötzformationen. Von B. Cotta. Freiberg, 1856.

Finlands Mollusker Beskrifne af A. D. Nordenskiöld och A. E. Nylander. Helsingfors, 1856.

Zoonomische Briefe, von Dr. H. Burmeister. 2ter theil. Leipzig, 1856.

Die kritischen Gruppen der Europäischen Clausilien von Adolf Schmidt. Leipzig, 1857.

The genera of the Plants of the United States illustrated by figures and analyses from nature. By Isaac Sprague, superintended, &c., by Asa Gray, M. D. 2 vols. New York, 1849.

13th. The following were presented by Dr. T. B. Wilson on the usual conditions:

The Zoologist. Nos. 117 to 167 inclusive.

A History of British Birds. By Rev. F. O. Morris, London. Parts 28 to 76 inclusive.

The Naturalist. Nos. 19 to 67 inclusive.

The Genera of recent Mollusca, &c. By H. and A. Adams. London. Parts 1 to 26 inclusive.

- Linnaea Entomologica.* Bd. 7, 8.
Naumannia. Archiv für die Ornithologie, &c. Quart. 2, 4.
Journal de Conchyliologie. An. 1852, Nos. 3, 4. An. 1853, Nos. 1, 2, 3, 4.
The History and Description of the Fossil Fuel, the Collieries and Coal Trade of Great Britain. London, 1841.
A Monograph on the Sub-class Cirripedia, with figures of all the species. By Charles Darwin. London, 1854.
Botanical and Physiological Memoirs. Edited for the Ray Society, by A. Henry. London, 1853.
Bibliographia Zoologiae et Geologiae. By L. Agassiz. Edited by Strickland and Jardine, for the Ray Society, Vol. IV. London, 1854.
Journal of an Expedition into the interior of Tropical Australia. By T. L. Mitchell. London, 1848.
Ipsa Linnæi Conchylia. By S. Hanley. London, 1855.
Monographia Pneumonoporum Viventium. Auc. L. Pfeiffer, Dr. Cassellis, 1852.
Proceedings of the Association for promoting the Discovery of the Interior parts of Africa. 2 vols. London, 1810.
A Monograph of the British Nudibranchiate Mollusca. By J. Alder and A. Hancock. Parts VI. and VII.
Amours des Salamandres Aquatiques et developpement du tetard de ces Salamandres depuis l'œuf jusqu'à l'animal parfait ouvrage du Docteur M. Rusconi. Milan, 1821.
Atti della Quarta Riunione degli Scienziati Italiani. Padova, 1843.
Atti della Quinta Unione della Scienziati Italiani. Lucca, 1844.
A Voyage to Terra Australis, by Matthew Flinders. 2 vols. with an Atlas. London, 1814.
The Colonial Journal, Vols. 1, 2, 3. London.
Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen, 5ter bd. Göttingen, 1853.
Voyages and Travels to India, Ceylon, the Red Sea, Abyssinia and Egypt. By George, Viscount Valencia. London, 1809, 3 vols.
Göttingisches Magazin der Wissenschaften und Litteratur. Heraus. von Lichtenberg und Forster. 3 vols.
The Certainties of Geology. By W. S. Gibson. London, 1840.
Handbuch zur Bestimmung und Kenntniss der phanerogamischen Gewächse dieser Provinz, &c. Von F. Wimmer. Berlin, 1832.
The Franklin Expedition. By Rev. W. Scoresby. London, 1850.
Considerations on Volcanos. By G. P. Scrope. London, 1825.
Éléments de Géologie et d'Hydrographie. Par H. Lecoq. Bruxelles. 1839.
A Syllabus of Lectures in Mineralogy, &c. By E. D. Clarke. Cambridge, 1820.
Description des Gîtes de Minéral, et des Bouches à feu de la France. Par le Baron Dietrich. Paris, 1789, 3 vols.
Narrative of an ascent to the summit of Mont Blanc. By J. Auldjo. London, 1828.
Systematische Beschreibung der Europäischen Schmetterlinge. Von J. W. Meigen. Bds, 1, 2, 3.
Agricola de Re Metallica, &c. Basileæ, 1546.
Transactions of the Tyneside Naturalists' Field Club. Vol. 2, parts 1, 2 and 3.
Insecta Saundersiana, Diptera. Parts 4 and 5. By F. Walker. London.
Comptes Rendus. T. 43, Nos. 21, 22, 23.
Die Natur. Nos. 33, 34, 35.
Bonplandia. 4 Jahr., Nos. 15 and 16.

February 3d. Report of the Commissioner of Patents for the year 1855. From the Patent Office.

Proceedings of the American Antiquarian Society. From the Society.

Journal of the London Society of Arts. Nos. 202—10, inclusive. From the Society.

- American Journal of Science and Arts. January, 1857. From the Editors.
 Charleston Medical Journal and Review. January, 1857. From the Editor.
 Proceedings of the Boston Society of Natural History. VI. pp. 49—64.
 Annales des Mines IX. 1, 2 liv. From the Minister of Public Works.
 Kongl. Vetenskaps-Akademiens Handlingar för 1853—4. Also Öfversigt of the same, 1855. From the Academy.
 Nachrichten von der Georg-Augusts-Universität und der Kgl. Gesellschaft der Wissenschaften zu Göttingen, 1855. 1—18. From the Society.
 Verhandlungen der Kaiserlichen Leopoldinisch-Carolinischen Akademie der Naturforscher. Vol. XXV. pts. 1, 2, and Supplement to Vol. XXIV. From the Academy.
 Schriften der in St. Petersburg gestifteten Russisch-Kaiserlichen Gesellschaft für die gesammte Mineralogie, 1 Bd. 1, 2. From the Society.
 Les dernières heures de la vie de l'Empereur Nicolas I. Vienne, 1855.
 Proceedings of the Academy of Natural Sciences of Philadelphia. January, 1857. From the Committee on Proceedings.
 10th. Journal of the Indian Archipelago. N. S. I. 1. From the Editor.
 Die Chemie der Gewebe des Gesammten Thierreichs von J. E. Schlossberger, 1 Bd. Leipzig und Heidelberg, 1856. From the Author.
 Proceedings of the American Philosophical Society. VI. 56. From the Society.
 The Canadian Journal, January, 1857. From the Editor.
 Descriptions of Terrestrial Shells of North America. By Thos. Say. From W. G. Binney.
 Monographie des Guêpes Sociales. Par H. de Saussure, 2d Cahier. From the Author.
 Erfahrungen über Ischl's Heil-Anstalten. Von Dr. J. Brenner. From the Author.
 The following were presented by Dr. T. B. Wilson on the usual conditions :
 Malakozoologische Blätter. Bd. 3, bogen 10—12.
 Bonplandia. IV. Nos. 20 and 21.
 Comptes Rendus. 43, Nos. 24, 25, 26.
 Journal of the Franklin Institute. January, 1857.
 17th. American Notes and Queries, I. 2. From the Editor.
 Journal de l'Instruction Publique, I. 1. From L. A. Huguet-Latour.
 New Orleans Medical and Surgical Journal. XIII. 4. From the Editor.
 The following were presented by Dr. T. B. Wilson on the usual conditions :
 Annals and Magazine of Natural History. Dec., 1856, Jan., 1857.
 Quarterly Journal of Microscopical Science. January, 1857.
 London, Edinburgh and Dublin Philosophical Magazine. Dec., 1856, and Supplement, and Jan., 1857.
 Histoire Naturelle des Coléoptères de France, Pectinipèdes. Par M. E. Mulsant. Paris, 1856.
 Conchologia Iconica. Part 158.
 Palæontographica. 4 Bd. 6 lief. and 6 Bd. 1 lief.
 Transactions of the Geological Society of London. VII. pt. 4.
 L'Organisation du Règne Animal. 21 liv.
 Xenia Orchidacea. 9 heft.
 Mittheilungen aus Justus Perthes' geographischer Anstalt, &c. Nos. 9, 10.
 Zeitschrift für Wissenschaftliche Zoologie. 8 Bd. 3 heft.
 Zur Kritik und Geschichte der Untersuchungen ueber das Algengeschlecht von Dr. N. Pringsheim. Berlin, 1857.
 Traité des Roches. Par H. Coquand. Paris, 1857.
 De la Houille. Par M. A. Burat. Paris, 1851.
 Witterung und Wachsthum oder Grundzüge der Pflanzenklimatologie. Von Hermann Hoffmann. Liepzig, 1857.
 Phytographie Médicale. Par Joseph Rogues. Paris, 1835. 3 vols. text, 1 vol. atlas.

- Études sur l'Histologie comparée du Système Nerveux chez quelques animaux inférieures.* Par Ernest Faivre. Paris, 1857.
- Description des animaux sans Vertèbres découverts dans le Bassin de Paris, &c. Par G. P. Deshayes. Paris, 1857, 1 and 2 livr.
- Das Gebiss der Schnecken zur begründung einer Natürlichen Classification untersucht von Dr. F. H. Troschel. Berlin, 1856, 1 lief.
- Fauna Austriaca, Die Käfer. Von L. Redtenbacher. Wien, 1857, 1 heft.
- Der Befruchtungsprocess in Pflanzenreiche und sein Verhältniss zu dem im Thierreiche. Von L. Radl-Kofer. Leipzig, 1857.
- Museum Botanicum Lugduno-Batavum. Auc. C. L. Blume, t. II. 1—12.
- Beiträge zur Paläontologie Württemberg's, &c. Von H. von Meyer und T. Plieninger. Stuttgart, 1844.
- Zur Fauna der Vorwelt, Fossile Säugethiere, Voegel, und Reptilien aus dem Molasse-Mergel von Oeningen. Von H. von Meyer. Frankfurt am Main, 1845.
- Zweite Abtheilung; Die Saurier des Muschelkalkes, &c., 1847—1855.
- March 3d. President's Message to Congress, and accompanying documents. 2 vols. From J. R. Tyson.
- The U. S. Naval Astronomical Expedition to the Southern Hemisphere. Vol. VI. Magnetic and Meteorological Observations. From Lieut. J. M. Gillis.
- Annales des Mines. 5 sér., t. IX. From the School of Mines.
- Proceedings of the Boston Society of Natural History. Pp. 65—80.
- Annual Report of the Geological Survey of the State of Wisconsin. By James G. Percival. From J. A. Lapham.
- American Notes and Queries. I. 3. From the Editor.
- American Journal of Science and Arts. From the Editors.
- La Correspondance Littéraire. No. 1.
- Journal of the Franklin Institute. Feb., 1857. From Dr. T. B. Wilson.
- Conchologia Iconica. Parts 159, 160. From Dr. Wilson.
- Die Natur. Nos. 45—51. From Dr. Wilson.
- The Canadian Naturalist and Geologist. Feb., 1857. From the Editor.
- Bulletin de la Société Impériale Zoologique d'Acclimatation, t. 3, No. 12. From Dr T. B. Wilson.
- Address on Public Education. By P. Tappan. From the Author.
- 10th. The following were presented by Mr. Edward Wilson on the usual conditions:
- Traitement homœopathique des Animaux. Par Alexandre.
- Memoires Physiologiques et pratiques sur l'aneurisme et la ligature des Artères. Par J. P. Maunoir.
- Dissertatio Medica de Natura et Usu lactis in diversis animalibus. Auc. T. Young, M.D. Edinburgi, 1776.
- Dissertatio inauguralis Medica de Cantharidibus. Auc. J. C. Arz Wiesero.
- Diss. inaug. Med. de Viperarum Usu Medico. Auc. C. J. Kutzschin.
- Manuel théorique et pratique pour le traitement des Maladies Vermineuses. Par Calvet. Paris, 1805.
- Diss. inaug. Med. de Morientium Cygneo Cantu. Auc. P. G. Haferung.
- Diss. inaug. de Morsu Viperæ. Sub. M. Ettmüller. Lipsiæ, 1685.
- De Hirundine Medicinali. Auc. C. E. Beyer. Lipsiæ, 1838.
- Exercitat. Histor.-Med. de Viperarum usu Medico. Auc. C. A. Mayer. Altorfii.
- De Sinu Cutaneo Ungularum ovis et Capræ. Auc. F. Klein. Berolini, 1830.
- Conjectures sur l'existence de quelques animaux Microscopiques, &c. Par C. Morel de Vindé. Paris, 1811.
- Die Salinischen Eisenmoorbäder zu Franzsensbad und ihre Heilwirkungen. Von Dr. F. Boschan. Wien, 1850.
- Expérimenta circa Sanguinis missionem, &c., de Antonii de Helde, M. D. Amstelodami, 1686.

17th. *Miscellanea Berolinensia ad incrementum Scientiarum, ex scriptis Societati Regiæ Scientiarum exhibitis, &c.* Berolini, 1710—1743. 7 vols. *Manuscrit de l'Académie Royale des Sciences et des Belles-Lettres de Berlin, 1745—1789.* 25 vols. *Nouveaux Mémoires de l'Académie Royale des Sciences et des Belles-Lettres.* 1770—1786. 17 vols. *Abhandlungen der Königl. Akademie der Wissenschaften in Berlin.* 1812—1850. 36 vols. From Dr. T. B. Wilson.

London Athenæum. January, 1857. From the same.

Biographical Memoir of the late F. A. Michaux. By M. Durand. From the Author.

Comptes Rendus. T. 44, Nos. 1, 2, 3. From Dr. T. B. Wilson.

Journal of the London Society of Arts. V. Nos. 211—214. From the Society.

On the Avoidance of Cyclones; with notices of a typhoon at the Bonin Islands.

By J. Rodgers and A. Schönborn. From the Authors.

Journal of Education. I. No. 1. From Huguet Latour.

Journal of the Franklin Institute. March, 1857. From Dr. T. B. Wilson.

Explorations of the Dakota Country in the year 1855. By Lieut. G. K. Warren. From the author.

Nouvelles Considérations sur la Nidification des Guêpes. Par H. de Saussure. From the Author.

Journal of the Proceedings of the Linnean Society. Zoology, I. Nos. 1, 2, 3. Botany, I. Nos. 1, 2, 3.

Transactions of the Linnean Society of London. Vol. 22, part 1st.

Monographie des Guêpes Sociales. Par H. de Saussure. 2 and 4. From the Author.

Proceedings of the Academy of Natural Sciences of Philadelphia. February, 1855. From the Committee on Proceedings.

Bulletin de la Société Impériale Zoologique d'Acclimatation. T. IV. No. 1. From Dr. T. B. Wilson.

24th. The Farmer's Journal. IV. No. 11. From L. A. Huguet Latour.

Charleston Medical Journal. March, 1857. From the Editor.

Journal de l'Instruction Publique. I. No. 2. From L. A. Huguet Latour.

Comptes Rendus. T. 44, Nos. 4, 5, 6. Tables des Comptes Rendus, 1er semestre, 1856. T. 42. From Dr. T. B. Wilson.

April 7th. Report on the Commerce and Navigation of the United States for the year ending June 30, 1856. From J. R. Tyson, Esq.

Report of the Secretary of the Treasury on the state of the Finances for the year ending June 30, 1856. From J. R. Tyson, Esq.

Notice of Remains of the Walrus discovered on the coast of the United States. Description of Remains of Fishes from the Carboniferous Limestone of Illinois and Missouri. Remarks on Saurocephalus and its allies. Observations on the Extinct Peccary of North America. Remarks on the Structure of the Feet of Megalonyx. By Jos. Leidy, M.D. From the Author.

Proceedings of the Boston Society of Natural History, vol. vi. pp. 97—128. From the Society.

Journal du Cultivateur, vol. iii. Nos. 1—12. From L. A. Huguet Latour.

Report of the Superintendent of Education for Lower Canada for 1850—'51. From L. A. Huguet Latour.

The Natural History of British Insects. By E. Donovan. London, 1833. 16 vols. From Geo. Ord, Esq.

Description of a new Baptista. By H. W. Ravenel. From the Author.

The following were presented by Dr. T. B. Wilson, on the usual conditions:

The London Athenæum. Feb., 1857.

Mittheilungen aus Justus Perthes' geographischer Anstalt, &c. Von Dr. A. Petermann. 1856. Nos. 11 and 12.

Novitates Conchologicæ, von Dr. Louis Pfeiffer. Cassel, 1855. 7 lief.

Die Familie der Bromeliaceen. Von J. G. Beer. Wien, 1857.

Untersuchungen über die Textur des Rückenmarks, &c. Von Dr. F. Bidder and Dr. C. Kupffer. Leipzig, 1857.

Mémoire sur le Camphrier de Sumatra et de Bornéo. Par W. H. De Vriese, Leide, 1857.

Fauna littoralis Norvegiæ, par Dr. M. Sars, J. Koren, and D. C. Danielssen. 2d livr. Bergen, 1856.

Phycæ Extræuropææ exsiccata, quas distribuit J. E. Areschong. 3d Fasciculus. Upsaliæ, 1856.

14th. Proceedings of the Academy of Natural Sciences of Philadelphia, March, 1857. From the Committee on Proceedings.

The Canadian Naturalist and Geologist, March, 1857. From the Editors.

On some of the bearings of Ethnology upon Archæological Science. By J. B. Davis. From the Author.

Speech of Hon. J. R. Tyson on the Fugitive Slave laws and Compromise Measures of 1850. From the Author.

The Transactions of the Academy of Science of St. Louis, Vol. i. No. 1. From the Academy.

Notes on some American Species of Cyclas, &c. By T. Prime. Part 1. The Hague, 1857. From the Author.

Ueber die Prioritätsrechte der Trilobiten-Gattung, &c. Von Dr. A. v. Volborth. Ueber die Russischen Sphæoniten. Von Dr. A. v. Volborth. Ueber einige Russische Trilobiten. Von Dr. A. v. Volborth. Ueber die Arme der Bisher zu den Armlosen Chrinoiden Gezählten Echino-Encrinen. Von Dr. A. Volborth. From Baron R. von Osten Sacken, in exchange.

The following were presented by Dr. T. B. Wilson, on the usual conditions:

Journal of the Franklin Institute, April, 1857.

Description des Animaux sans Vertèbres découverts dans le Bassin de Paris, &c. Par G. P. Deshayes. 3e and 4e livr. Paris, 1857.

Bonplandia, 4 Jahr., Nos. 22, 23, 24, and 5 Jahr., Nos. 1 and 2.

Die Natur, 1856, No. 52, and 1857, Nos. 1—9.

Insect Architecture, &c. By Jas. Rennie. London, 1857.

Introduction to Cryptogamic Botany. By Rev. M. J. Berkeley. London, 1857.

Annals and Magazine of Natural History. Feb. and March, 1857.

London, Edinburgh and Dublin Philosophical Magazine. Feb. and March, 1857.

Conchologia Iconica. Parts 161, 162 and 163.

Papers of the Palæontological Society. Vol. for 1856.

21st. The Canadian Journal of Industry, Science and Art, March, 1857. From the Editors.

Synopsis avium Tanagrinarum. By P. L. Sclater. London, 1857. From the Author.

Description of New Fossil Crinoidea, &c. By B. F. Shumard, M.D. From the Author.

Tafeln der Flora, mit Berücksichtigung der Störungen durch Jupiter und Saturn entworfen, von Dr. F. Brünnow. Berlin, 1855. From the Author.

Abhandlungen herausg. von der Senckenbergischen Naturforschenden Gesellschaft. 2 bd. 1 lief. Frankfurt A. M., 1856. From the Society.

Abhandlungen der k. k. Geologischen Reichsanstalt. 3 bd. Wien, 1856. From the Institute.

Jahrbuch der k. k. Geologischen Reichsanstalt. 1855, No. 4; 1856, No. 1. From the same.

Berichte über die Verhandlungen der k. Säch. Gesellschaft der Wissenschaften zu Leipzig. 1854, iii.; 1855, i. ii.; 1856, i. From the Society.

Nachträge zur Theorie der Musikalischen Tonverhältnisse. Von M. W. Drobisch. Leipzig, 1855. From the same.

Electrodynamische Maassbestimmungen, &c. Von R. Kohlrausch und W. Weber. Leipzig, 1856. From the same.

Berechnung der absoluten Störungen der kleinen Planeten. Von P. A. Hansen. Leipzig, 1856. From the same.

Nebelflecken und Sternhaufen. Von H. D'Arrest. 1ste Reihe, Leipzig, 1856. From the same.

Oversigt over det Kongelige danske Videnskabernes Selskabs Forhandling og dets Medlemmers Arbejder i Aaret 1855. From the Association.

Det Kongelige danske Videnskabernes Selskabs Skrifter. Fjerde Bind. 1ste hefte. Kjøbenhavn, 1856. From the Association.

Observationes Meteorologicæ per Annos 1832—'54 in Grönland factæ A. C. G. Ostergaard, L. A. Mossin, J. M. P. Kragh, C. N. Rudolph, F. P. E. Bloch. Hauniæ, 1856. From the Danish Society of Sciences.

Comptes Rendus, T. 44, Nos. 7, 8, 9, 10. From Dr. T. B. Wilson.

Mémoire sur un nouveau Système de Moteur fonctionnant toujours avec la même vapeur, &c. Par M. Seguin Aîné. From Dr. T. B. Wilson.

Revue et Magasin de Zoologie pure et Appliquée. 1857. No. 1. From Dr. T. B. Wilson.

Malakozoologische Blätter. Bd. 3, bogen 16. Bd. 4, bogen 1, 2. From Dr. Wilson.

Report of the Geological Survey of Kentucky, made during the years 1854—'5, by David Dale Owen. From the Author.

May 5th. Indigenous Races of the Earth; or New Chapters of Ethnological Inquiry, &c. By J. C. Nott and G. R. Gliddon; with contributions from A. Maury, F. Pulszky, and J. A. Meigs; and communications from J. Leidy and L. Agassiz. From J. C. Nott and G. R. Gliddon.

American Journal of Science and Arts, May, 1857. From the Editors.

Schriften der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg. 8 Bd. From the Society.

Verhandlungen der Naturforschenden Gesellschaft in Basel. 1, 2, 3 heften. From the Society.

Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefaktenkunde. 1856. 5, 6 heften. From H. G. Bronn.

Verhandlungen des Vereines zur Beförderung des Gartenbaues, in den Königlich Preussischen Staaten. Januar bis Juni, 1856; Juli bis December, 1855. From the Association.

Archiv für Naturgeschichte, 21 Jahr., 6 Heft.; 22 Jahr., 1, 2 Heften. From Dr. Troschel.

The following were presented by Dr. T. B. Wilson, on the usual conditions: Revue et Magasin de Zoologie, 1857, No. 2.

Comptes Rendus, t. 44, Nos. 11 and 12.

Bulletin de la Société Imperiale Zoologique d'Acclimatation. Mars, 1857.

Naturgeschichte der Insecten Deutschlands. 4 Bd. 1st Lief.

Indicis Generum Malacozoorum supplementa et corrigenda. Auc. A. N. Hermannsen. Cassellis, 1852.

Zeitschrift für Wissenschaftliche Zoologie. 8 Bd., 4 Heft.

Species, Genera et Ordines Algarum. Auc. J. G. Agardh. Vol. 2di, pars 3. Lundæ, 1852.

Museum Botanicum Lugduno-Batavum. Auc. L. Blume. T. 3, fasc. 13—16.

Recensio Critica Araneorum Suecicarum quas descripserunt Clerckius, Linnaeus, Dr. Geerus. Scripsit T. Thorell. Upsaliæ, 1856.

Über einige Farngattungen von Dr. G. Mettenius. I. Polypodium. Frankfurt A. M., 1857.

Über die Entwicklung der Sagitta. Von Dr. C. Gegenbaur. Halle, 1857.

Trematodenlarven und Trematoden. Von Dr. H. A. Pagenstecher. Heidelberg, 1857.

Catalogue of Plants growing without Cultivation in the Counties of Monmouth and Ocean, New Jersey. By P. D. Kneskern, M.D. Trenton, 1857. From Geo. H. Cook.

Third Annual Report of the Geological Survey of the State of New Jersey, for the year 1856. From Geo. H. Cook.

May 12th. Catalogus Conchyliorum quæ reliquit D. A. D'Aguirra and Gades Comes de foldi, &c. Scripsit O. A. L. Mörch. Fascic. I. Cephalophora. Hafnia, 1852. From A. H. Rüse.

United States Exploring Expedition. Vol. xii. Mollusca and Shells. By A. H. Gould, M.D. Boston, 1852. From the Author.

The Terrestrial Air-breathing Mollusks of the United States and the adjacent Territories of North America; described and illustrated by Amos Blaney. Edited by A. A. Gould. Vol. iii. Plates. Boston, 1857. From the Executors of the late Dr. Binney, in accordance with his will.

May 19th. Bulletin of the Imperial Society of Naturalists of Moscow. Nos. 2, 3, 4 for 1855, and No. 1 for 1856. From the Society.

Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou. Tome X. ou XI. de la Collection. Moscou, 1855. From the Society.

Gelehrte Anzeigen, 42 und 43 Bd. From the Bavarian Academy of Sciences.

Nova Acta Regiæ Societatis Scientiarum Upsaliensis. Ser. Ter. Vol. ii. Fascic. prior 1856. From the Society.

Abhandlungen der Königlich böhmischen Gesellschaft der Wissenschaften. 5ter Folge, 9ter Bd. Prag, 1857. From the Society.

Württembergische Naturwissenschaftliche Jahreshefte. 10ter Jahr., 3 Heft. 12ter Jahr., 3 Heft. 13 Jahr., 1 Heft.

Verhandelingen der Koninklijke Akademie van Wetenschappen. 3 Deel. From the Academy.

Verslagen en Mededeelingen der Koninklijke Akademie van Wetenschappen. 1ste Deel.; 3 Stk., 2de Deel.; 1 Stk., 3de Deel.; 3de Stk.; 4de Deel. 1, 2, 3 Stk. 5 Deel., 1ste Stk. From the Academy.

Natural History Review, London. 1856, Nos. 9, 10, 11; 1857, No. 1. From the Editors.

Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefaktenkunde. 1856, 7 Heft.; 1857, 1 Heft.

Verhandlungen der Russisch-Kaiserlichen Mineralogischen Gesellschaft zu St. Petersburg. 1855-6. From the Society.

Verhandlungen des Naturhistorischen Vereines der preussischen Rheinlande und Westphalens. 13 Jahr. 2, 3 Heften. From the Union.

Kleine Schriften der Naturforschenden Gesellschaft in Emden. Die Gewitter des Jahres, 1855. Von Dr. M. A. F. Prestel. From the Society.

Lycidas Ecloga et Musæ invocatio, &c. From J. Van Leeuwen.

The following were presented by Dr. W. R. Weitenweber, of Prag.

Systematisches Verzeichniss der böhmischen Trilobiten, &c. Mitgetheilt von Dr. W. R. Weitenweber. Prag, 1857.

Anweisung bezüglich des häuslichen Gebrauches der Künstlichen Seebäder nach der von dem Apotheker J. Fracchia, &c.

Aus dem Leben und Wirken des Herrn Dr. J. T. Held, von Dr. W. R. Weitenweber.

The Lotos, Sept. to Dec., 1853; Jan. to Dec., 1854.

Die Ichneumonien der Umgegend von Kaplitz. Von L. Kirchner. Prag, 1856.

Ueber Miletan in Böhmen ein topographisch-historischer Versuch von J. L. Yandera. Prag, 1830.

Zur Feir des 50 jährigen Doctorjubiläums de Herrn J. Jeitales, &c.

Der Arabische Kaffee, geschildert von Dr. W. R. Weitenweber.

Dr. J. C. E. Hoser's Rückblicke auf sein Leben und Wirken. Prag, 1848.

June 2d. Quarterly Journal of the Geological Society, Vol. 13, Part 1. From the Society.

Proceedings of the Boston Society of Natural History. VI. pp. 145-176. From the Society.

Nouveau Mémoire sur la question relative aux *Ægilops*, *Triticoides* et *Speltaformis*, par A. Jordan. Paris, 1857. From the Author.

Ichthyology. From the Editors of the Encyclopædia Britannica.

DONATIONS TO LIBRARY.

v.*

Transactions of the American Philosophical Society, vol. ii. part 1. From the Society.

Giornale dell' J. R. Instituto Lombardo di Scienze Lettere ed Arti e Biblioteca Italiana. Fascic. 37—45 inclusive. From the Society.

Sulla Successione Normale dei diversi membri del Terreno Triasico nella Lombardia, memoria di G. Curioni. From the Author.

The following were presented by Dr. T. B. Wilson, on the usual conditions:

Life in its Lower, Intermediate, and Higher Forms. By P. H. Gosse, London. 1857.

Essai sur la Faune de L'Ile de Woodlark ou Moiu. Par P. Montrouzier. Lyon. 1857.

Bonplandia. v. Jahr., Nos. 3—5.

Die Natur. Nos. 10—15.

Neue Untersuchungen über des Bau den Rückenmarks von Dr. B. Stilling. 2te Lief. Atlas, Taf. 1, 11—17. Cassel, 1857.

Journal of the Franklin Institute. May, 1857.

London, Edinburgh and Dublin Philosophical Magazine. April, 1857.

Quarterly Journal of Microscopic Science. April, 1857.

Annals and Magazine of Natural History. April, 1857.

Revue et Magazin de Zoologie. 1857. No. 3.

Comptes Rendus. Tome 44. Nos. 13—16.

June 9th. Proceedings of the Philadelphia Society for promoting Agriculture, for the years 1854—5—6. From Dr. A. L. Kennedy.

London Journal of the Society of Arts, v. Nos. 215—227. From the Society.

Bulletin of the Imperial Society of Acclimatation. April, 1857. From Dr. T. B. Wilson.

Canadian Naturalist and Geologist. May, 1857. From the Editors.

Canadian Journal of Industry, Science and Art. May, 1857. From the Editors.

Journal of Franklin Institute. June, 1857. From Dr. T. B. Wilson.

June 16th. Malakozoologische Blätter. Bd. iv. Bogen 3—5. From Dr. T. B. Wilson.

Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich. 1ste Jahr. 1, 2, 3, 4. Hefen. From the Society.

Entomologische Zeitung. 17 Jahr. From the Entomological Union of Stettin.

Fourth Annual Report of the Secretary of the Massachusetts Board of Agriculture. Boston. 1857. From C. J. Flint.

Jahrbücher des Vereins für Naturkunde im Herzogthum Nassau 11 Heft. Wiesbaden, 1856. From the Union.

Jahrbuch der Kaiserlich-Königlichen Geologischen Reichsanstalt. 7 Jahr. Nos. 2, 3. From the Institute.

Bonplandia, v. Jahr., No. 26.

Die Natur, 1857, No. 16, 17, 18.

Silification Organischer Körper. Von A. Petzholdt. Halle, 1853. The three preceding from Dr. T. B. Wilson.

Journal de L'Instruction Publique, i. Nos. 3 and 4. From L. A. Huguet Latour.

June 23d. Memoirs of the American Academy of Arts and Sciences. New Series, vol. i. part 1. From the Academy.

Human Physiology. By R. Dunglison, M.D., &c. 8th edition, 1856, 2 vols. From the Author.

Monographs of the Tribolites of North America. By Jacob Green, M. D. Philadelphia. 1832. From T. A. Conrad.

Journal of the Indian Archipelago and Eastern Asia. New Series, vol. i. No. 2. From the Editor.

American Geology, containing a Statement of the Principles of the Science, with full illustrations of the Characteristic American Fossils. By E. Emmons. Part vi. Albany, 1857. From Dr. J. Leidy.

Annales des Mines. 5me Ser. t. x. 5e livr. de 1856. From the School of Mines.

Discours prononcés aux Funérailles de M. Dufrénoy. Paris, 1857. From School of Mines.

The following were presented by Dr. T. B. Wilson on the usual conditions:

Travels and Discoveries in North and Central Africa. By Henry Barth. London, 1857. Vols. 1, 2, 3.

London, Edinburgh and Dublin Philosophical Magazine, May, 1857.

Histoire Naturelle des Insectes, Genera des Coléoptères. Par Th. Lacordaire. T. 4me. Paris, 1857.

Museum Botanicum Lugduno Batavum. Auc. C. L. Blume. T. i.

Mittheilungen aus Justus Perthes Geographischer Anstalt. Von Dr. A. Petermann, 1847, i.

Novitates Conchologicæ, 8 lief.

Palæontologica Svecica. Auc. N. P. Angelin. Part i.

Das Electrische Organ des Zitterwelses anatomisch Beschrieben. Von Dr. Th. Billharz. Leipzig, 1857.

Flora Tertiaria Helvetia. Von Dr. Oswald Heer. 6 Lief.

Annals and Magazine of Natural History. May, 1857.

Revue et Magazin de Zoology. 1857. No. 4.

Comptes Rendus, t. 44, Nos. 17, 18, 19, 20, and Tables des Matières du tome 43.

Traité de Paléontologie. Par F. J. Pictet. T. 4me, with Atlas. 4 livr. Planches 85-110. Paris, 1857.

Conchologia Iconica. Parts 164, 165, door F. A. W. Miquel. 1ste Deel, Aflev. 5; 2de Deel, Aflev. 1.

Bibliotheca Geographica, Heraus. Von. W. Engelmann, 1ste Hälfte. Leipzig, 1857.

Monographia Auriculaceorum viventium, Auc. L. Pfeiffer, Dr. Cassellis, 1856.

Description des Animaux Sans Vertèbres découverts dans le Bassin de Paris, 1et 6 livr. Pages 161 à 240, Planches 21 à 30. Par. G. P. Deshayes. Paris, 1857.

July 7th. Charleston Medical Journal and Review, July, 1857. From the Editor.

American Journal of Science and Arts, July, 1857. From the Editors.

Über die Selbstständigkeit der Species des Ursus Ferox Desm. Von Prinz Max. von Wied mit Anatomischen Bemerkungen von Dr. C. Mayer. From Maximilian of Wied.

The following were presented by Dr. T. B. Wilson.

Die Parasiten der Chiroptern von Prof. Dr. F. A. Kolenati. Dresden, 1857.

Bulletin de la Société Imperiale Zoologique d'Acclimatation, Mai, 1857.

Die Natur. Nos. 19, 20.

Bonplandia. No. 7.

London Athanæum, May, 1857.

Etymologisch-botanisches Handwörterbuch. Von Dr. G. C. Wittstein. Erlangen, 1857.

Proceedings of the American Academy of Arts and Sciences. Vol. 2. From the Academy.

July 14th. An account of the Smithsonian Institution, its Founder, Building, Operations, etc. By Wm. J. Rhees, Washington, 1857. From the Author.

New Orleans Medical and Surgical Journal. July, 1857. From the Editor.

Journal of the Franklin Institute, July, 1857. From Dr. T. B. Wilson.

DONATIONS TO LIBRARY.

vii.

On the Cyclones or Typhoons of the North Pacific Ocean. By W. C. Redfield. From the Author.

Memoirs of the Geological Survey of India. Vol. 1, pt. 1. Calcutta, 1856. From the Survey.

July 21st. Studies in Organic Morphology. By J. Warner. From the Author.

Revue et Magasin de Zoologie, 1857, No. 5. From Dr. T. B. Wilson.

Proceedings of the Boston Society of Natural History. Vol. 6, pp. 177 to 208. From the Society.

The Crustacea and Echinodermata of the Pacific shores of North America. By Wm. Stimpson. From the Author.

The Canadian Journal of Industry, Science and Art, July, 1857. From the Editor.

Natuurkundig Tijdschrift voor Nederlandsch Indië, Deel 12, Aflg, 1-3. From the Natural History Union.

Bulletin de la Société Impériale Zoologique d'Acclimatation. T. IV, No. 6.

Comptes Rendus, T. 44, No. 21, 22, 23, T. 36, No. 8, T. 31, No. 21.

Tables des Comptes Rendus, T. 36 et 43.

August 11th. Tableaux of New Orleans. By Bennett Dowler, M. D. From the Author.

Tableaux of the Yellow Fever of 1853, with sketches of the Epidemics of New Orleans. By Bennett Dowler, M. D. From the Author.

The Canadian Naturalist and Geologist, July, 1856. From the Editors.

The Natural History Review, (London,) April, 1857. From the Editors.

The London Journal of the Society of Arts, vol. v. No. 328 to 231.

Nachrichten von der Georg-Augusts-Universität und der K. Gesellschaft der Wissenschaften zu Göttingen, 1856, No. 1-18. From the Royal Society of Göttingen.

Archiv für Naturgeschichte, 22 Jahr., 3 Heft. From Dr. Troschel.

Monographie des Guêpes Sociales, Par Henri de Saussure, Cahier 5. From the Author.

Mittheilungen der Naturforschenden Gesellschaft in Zurich, Heften 1 to 10. From the Society.

Annales des Mines, 5me série, t. x. From the Administration of Mines.

Essai d'Application à la Classe des Reptiles d'une Distribution par séries parallèles et Description d'un Saurien type d'un genre nouveau dans la Famille des Iguaniens. Par Dr. Auguste Duméril. From the Author.

Comptes Rendus, t. 34, Nos. 24, 25, 26. From Dr. T. B. Wilson.

Revue et Magasin de Zoologie, 1857, No. 6. From Dr. Wilson.

Journal of the Franklin Institute, August, 1857. From Dr. Wilson.

Traité de Physiologie, Par. F. A. Longet, t. 1er, 2d partie, fascic 2. Paris, 1857. From Dr. Wilson.

Sept. 1st. The following were presented by Dr. T. B. Wilson on the usual conditions:

Crania Britannica. By J. B. Davis and J. Thurnam, 2d Decade, London, 1857.

Popular History of the Aquarium of Marine and Fresh-Water animals and Plants. By G. B. Sowerby. London, 1857.

Rain and Rivers; or Hutton and Playfair against Lyell and all comers. By Col. G. Greenwood. London, 1859.

The Annals and Magazine of Natural History, June and July, 1857.

London, Edinburgh and Dublin Philosophical Magazine, June, July, and Supplement, 1857.

Quarterly Journal of Microscopical Science, No. 20.

Tagesfragen aus der Naturgeschichte. Von C. G. Giebel, Berlin. 1857.

Bulletin de la Société Impériale Zoologique d'Acclimatation, July, 1857.

Beiträge zur Malakologie von Adolf Schmidt. Berlin, 1857.

- Beiträge zur Naturgeschichte der Europäischen Chiroptern. Dr. Kolenati. Dresden, 1857.
- Notitiæ Malacologicæ. Von R. J. Shuttleworth, 1 Heft. Bern, 1856.
- Fauna der Wirbelthiere Deutschlands. Von J. H. Blasius. Braunschweig, 1857, 1ster Bd.
- Die Natur, Nos. 21 to 26.
- Bonplandia, Nos. 8 to 10.
- Mittheilungen aus Justus Perthes Geographischer Anstalt über Wichtige neue Erforschungen, &c. Von Dr. A. Petermann. Nos. 2 and 3.
- Neue Untersuchungen über den Bau des Rückenmarks von Dr. B. Stilling, 3 Lief. Atlas Mikroskopisch, Anatomischer Abbildungen, &c. By the same, 3 Lief, Taf, 18-22 Cassel, 1857.
- Beiträge zur Nacheren Kenntniss der urweltlichen Säugethiere von Dr. J. J. Kaup, 3 Heft. Darmstadt, 1857.
- Untersuchungen über die Entwicklung des Schädelgrundes im Gesunden und Krankhaften Zustande und über den Einfluss derselben auf Schädelform, Gesichtsbildung und Gehirnbau. Von R. Virchow. Berlin, 1857.
- Die im Bernstein befindlicher organischen Reste der Vorwelt. Von Dr. G. C. Berendt, 2 Bd. Berlin, 1856.
- Systematisches Conchylien Cabinet, von Martini und Chemnitz, Nos. 108 to 155.
- Fossils of South Carolina. By M. Tuomey and F. S. Holmes. Charleston S. C. Nos. 1 to 12.
- Palæontologie Française, Terrains Jurassiques, Livr. 84 to 108. Terr. Crétacés, Livr. 203 to 254.
- Deutschlands Fauna von H. G. L. Reichenbach, Tenuirostres, 51 plates; Trochilinæ, 95 plates; Meropinæ, 67 plates; Picinæ, 66 plates.
- Sept. 8th. The following were presented by Mr. Edward Wilson, on the usual conditions:
- Memoria sobre a virtude Tœnifuga da Romeira. Par B. A. Gomes. Lisbon, 1822.
- A Spigelii de Lumbrico Lato liber. Batavii, 1618.
- Vermium Intestinatorum Hominis Historia. Defendet C. F. Happ. Lipsiæ.
- Reichard, De Pediculis inguinalibus insectis et Vermibus homini molestis. Erfurti, 1759.
- Michæle, De Vermibus in homine. Lipsiæ 1628.
- F. Tiedemann von lebenden Würmern und Insekten im den Geruchsorganen des Menschen. Mannheim, 1844.
- Rossollin. Essai sur les vers intestinaux, qu'on rencontre dans l'homme. Montpellier, 1814.
- Jaurand. Considérations sur les causes et les effets des vers dans le canal intestinal de l'homme. Paris, 1833.
- Hoffmeister, De vermibus quibusdam ad genus lumbricorum pertinentibus. Borolini, 1842.
- Turpin. Dissertation sur les Vers des intestins. Paris, 1834.
- L'Herminier. Dissertation sur le Dragonnean. Paris, 1826.
- Mikrographische Beiträge zur Entomologie und Helminthologie, von Dr. K. A. Ramdor. 1er Thiel. Halle, 1805.
- Die eingebildeten Würmer in Zähnen von J. C. Schäffer. Regensburg, 1757.
- Trampel. De Tœnia Gœttingæ.
- Rudolphi. Observationes circa vermes intestinales. Gryphiswaldiæ, 1793.
- Kühn. De Ascaridibus per urinam emissis. Jenæ, 1798.
- Hahn. De Tœnia, Lipsiæ, 1717.
- Greydanus. De Lumbricis. Franekeræ, 1654.
- Beschreibung des Bandwurmes.
- Harvies. De Vermibus intestinatorum. Edinburgi, 1790.
- Heller. De Helminthiasi. Berolini, 1837.

Drauth. De Animalibus humanorum corporum infestis hospitibus. Halæ Magdeburgicæ, 1734.

Théorie de l'origine des Montagnes. Par B. G. Sage. Paris, 1809.

Incendio del Monte Vesuvio di Pietro Castelli Romano. Roma, 1632.

Mémoire sur la théorie des Marées. Par Ch. Delaunay.

Sept. 15th. Catalogue of North American Mammals chiefly in the Museum of the Smithsonian Institution. By S. F. Baird. From the Author.

Proceedings of the Boston Society of Natural History, vol. vi. pp. 209 to 240. From the Society.

Canadian Journal of Industry, Science and Arts, September, 1857. From the Editors.

Proceedings of the Elliott Society, pp. 49 to 104. From the Society.

Report on the Recent Contributions of Chemistry to the Medical Profession. By Dr. L. H. Steiner. From the Author.

The Rh Ya, or Ready Guide; the oldest dictionary extant in the Chinese language, edited by Tsang Ngau of Nau-Ching, 1802. From Dr. L. B. McCartee.

Journal of the Franklin Institute, September, 1857. From Dr. T. B. Wilson.

Comptes Rendus, t. 45, Nos. 1 to 5. From Dr. Wilson.

London Athenæum, July, 1857. From Dr. Wilson.

Sept. 22d. First Annual Report of the Board of Directors of the McKean and Elk Land and Improvement Company to the Stockholders. Philadelphia, 1857. From Dr. C. M. Cresson.

Proceedings of the American Association for the Advancement of Science, 10th meeting. From the Association.

Revue et Magasin de Zoologie, No. 7. From Dr. T. B. Wilson.

Comptes Rendus, t. 45, No. 6. From Dr. Wilson.

October 6th. Smithsonian Contributions to Knowledge, vol. viii. From the Smithsonian Institute.

Tenth Annual Report of the Board of Regents of the Smithsonian Institution. From the Institution.

Annual Report of the Board of Regents of the Smithsonian Institution for the year 1856. From the Institution.

London Athenæum, August, 1857. From Dr. T. B. Wilson.

Bulletin de la Société Impériale Zoologique d'Acclimatation, August, 1857. From Dr. Wilson.

Malakosologische Blätter, Bd. 4; Bogen 6-8. From Dr. Wilson.

Comptes Rendus, t. 45; Nos. 7 and 8. From Dr. Wilson.

Mémoires couronnés et Mémoires des savants étrangers, publiés par l'Académie Royale des Sciences, des Lettres et des Beaux Arts de Belgique, tomes 27 et 28. From the Academy.

Mémoires de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique, tome 30. From the Academy.

Bulletins de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique, t. 22, 2d part; 23, 1st and 2d parts. From the Academy.

Annuaire de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique, 1856 et 1857. From the Academy.

Notice sur G. J. A. Baron de Stassart. Par A. Quetelet. From the Author.

Rapport adressé à M. le Ministre de l'Intérieur sur l'État et les travaux de l'observatoire royal pendant l'année 1856. Par A. Quetelet. From the Author.

Preliminary Report on the Geology and Agriculture of the State of Mississippi. By L. Harper, LL. D. Jackson, 1857. From the Author.

Reports of Explorations and Surveys to ascertain the most practicable and economical route for a railroad from the Mississippi river to the Pacific ocean vol. ii. Washington, 1855. From the Secretary of War.

October 13th. Sitzungsberichte der kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftlich Classe. 20 Bd. 2 und 3 Heft.; 21 Bd.

1 und 2 Heft.; 22 Bd. 1, 2 und 3 Heft.; 23 Bd. 1 Heft. From the Academy of Sciences in Vienna.

Register zu den zweiten 10 Bänden der Sitzungsberichte (Bd. 11–20) der Mathemat-Naturwissenschaftlichen Classe der K. Akad. der Wissenschaften. From the same.

Denkschriften der kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe, 12 Bd. From the same.

Verhandlungen des naturhistorischen Vereines der preussischen Rheinlande und Westphalens, 13ter Jahr., 4 Heft., 14er Jahr., 1tes Heft. From the Association.

Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefakten-Kunde, 1857, 2 Heft. From Prof. H. G. Bronn.

Archiv für Naturgeschichte, 23 Jahr., 1tes Heft. From Dr. F. H. Troschel.

Neueste Schriften der Naturforschenden Gesellschaft in Danzig, 2 Bd., 3 und 4 Heft., 3 Bd. 4 Heft.; 4 Bd., 1, 2, 3 und 4 Heft.; 5 Bd. 1, 2, 3, 4 Heft. From the Society.

Tageblatt der 32 Versammlung Deutscher Naturforscher und Ärzte in Wien im Jahre, 1856. Nos. 1 to 8. From the Convention.

London Journal of the Society of Arts, vol. 2, Nos. 222 to 240. From the Society.

Proceedings of the American Philosophical Society, vol. 6, No. 67. From the Society.

Catalogue of the Ninth Exhibition of Inventions. From the Society for the encouragement of Arts, Manufactures and commerce of London.

Report of the Secretary of War respecting the purchase of camels for the purposes of military transportation.

November 3d. Report of the Commissioner of Patents for the year 1855, Arts and Manufactures, 3 vols. Washington, 1857. From the Commissioner.

Natural History Review. London, July, 1857. From the Editors.

Etudes Entomologiques, rédigées par V. de Motschulsky, 1–5. Helsingfors. From M. de Motschulsky.

Monographie des Guêpes Sociales, Cahier 8. Par H. de Saussure. From the Annales des Mines, 5ème série; t. 11; 1 livr., 1857.

The following were presented by Dr. T. B. Wilson, on the usual conditions:

System der Ornithologie Westafricas von Dr. G. Hartlaub. Bremen, 1857.

London Athenæum, September, 1857.

Revue et Magasin de Zoologie, 1857, No. 8.

Bulletin de la Société Impériale, t. 4, No. 9.

Comptes Rendus, t. 45, 9–12.

Die Natur, 1857, No. 27–35.

Kosmos, 1857, Nos. 1–7.

November 10th. Address on the Scientific life and labors of William C. Redfield, A. M., &c. By D. Olmsted. From the Author.

Report of the Commissioner of Patents for the year 1855. Agriculture. From the Commissioner.

New Orleans Medical and Surgical Journal, November, 1857. From the Editors.

American Journal of Science and Arts, November, 1857. From the Editors.

Annals des Mines, 5ème série, t. 11, 2d livr. de 1857. From School of Mines.

Bulletin de la Société des Sciences Naturelles de Neuchatel, t. 4, 1 cah. From the Society.

Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefakten-Kunde, 1857, 3 Heft. From H. G. Bronn.

Zweiundvierzigster Jahresbericht der Naturforschenden Gesellschaft in Emden für 1856. From the Society.

Abhandlungen aus dem Gebiete der Naturwissenschaften herausg. von dem naturwissenschaftlichen Verein in Hamburg, 3 Bd. From the Union.

- The following were presented by Dr. T. B. Wilson on the usual conditions :
- Journal of the Franklin Institute, November, 1857.
- Die Conchylien des norddeutschen Tertiärgebirges von Dr. E. Beyrich, 6 Lief.
- Naturgeschichte der Insecten Deutschlands, 1 ab, 1 Bd. 2 Lief. and 2 Bd. 3, 4, Lief.
- Fauna Austriaca. Die Käfer, von L. Redtenbacher, 2, 3 und 4 Heften.
- Das Gebiss der Schnecken zur begründung einer natürlichen Classification untersucht von Dr. F. H. Troschel, 2 Lief. Berlin, 1857.
- Mittheilungen aus Justus Perthes Geographischer Anstalt, &c., 1857, Nos. 4, 5, 6, 7, 8.
- Novitates Conchologicæ. Par Dr. L. Pfeiffer. 9 Livraison.
- Atlas der Cranioscopie von Dr. C. G. Carus. Heft. 2.
- Diagnoses Plantarum Novarum præsertim Orientalium nonnullis Europæis Boreali-Africanisque additis. Series secunda, Nos. 2, 3, 5. Auc. E. Boissier. Lipsiæ, 1856.
- Jahrbücher für wissenschaftliche Botanik Herausg. von Dr. N. Pringshein, 1 Bd., 1 Heft. Berlin, 1857.
- Über die Geologie des südlichen Nordwegens von T. Kjerulf. Christiania, 1857.
- De Bodem van Nederland door W. C. H. Staring, 2 deel. Haarlem, 1857.
- Observationes Phycologicæ in Floram Batavam. Auc. W. F. R. Suringar. Leovardiæ, 1857.
- Wiener Entomologische Monatschrift. Bd. 1, No. 1.
- Synopsis des Échinides Fossils par E. Desor. Paris, 1854-7, 1, 2, 3, 4 Livr. Planches 1-29.
- Synopsis Hepaticarum Javanicarum, Descrip. et illustrav. C. M. Van der Sande Lacoste. Amstelædami, 1856.
- Felices Javanicæ seu Observationes Botanicæ, etc. Fecit J. K. Hasskarl. 1 Pugillus. Bataviæ, 1856.
- Beiträge zur Kenntniss der Phylломorphose. Von Dr. G. W. J. Ropmann. 1 Heft. Giessen, 1857.
- November 17th. Contributions to the Natural History of the United States of America. By Louis Agassiz. Boston, 1857. Vols. 1 and 2. From Dr. T. B. Wilson.
- L'Organisation du Règne Animal. Par Émile Blanchard. Livr. 22. From Dr. Wilson.
- Description des Animaux sans Vertébres découverts dans le bassin de Paris. Par G. P. Deshayes. 7-10 Livraisons. From Dr. T. B. Wilson.
- Plates for the Essays on the Microscope. By G. Adams. London, 1787. From J. H. Slack.
- Charleston Medical Journal and Review. November, 1857. From the Editor.
- Experimental Researches relative to the Nutritive Value and Physiological Effects of Albumen, Starch and Gum, when singly and exclusively used as food. By W. A. Hammond, M. D., Philadelphia, 1857. From the Author.
- Report of the 26th meeting of the British Association for the advancement of Science. London, 1857. From the Association.
- Quarterly Journal of the Geological Society, Vol. 13, No. 51. From the Society.
- Quarterly Journal of Microscopical Science, No. 21. From Dr. T. B. Wilson.
- London, Edinburgh and Dublin Philosophical Magazine, 4th Series, Nos. 91-93. From Dr. T. B. Wilson.
- Annals and Magazine of Natural History. August, September and October, 1857. From Dr. T. B. Wilson.
- Proceedings of the American Pharmaceutical Association at the 6th Annual Meeting, held in Philadelphia, September, 1857. From Dr. S. S. Garrigues.
- Description of a new Tanager of the genus Euphonia. Review of the species of the South American subfamily Tityrinæ. By P. L. Sclater. From the Author.

Further additions to the list of Birds received in collections from Bogota. By P. L. Sclater. From the Author.

December 1st. The following were presented by Dr. T. B. Wilson on the usual conditions:

London Athenæum, October, 1857.

Reisen in Nord-Ost-Afrika, von Theodor von Heuglin. Gotha, 1857.

Conspectus Generum Avium. Auctore C. L. Bonaparte. Tom. ii.

Die im Bernstein befindlichen organischen Reste der Vorwelt. Herausg. Von Dr. G. C. Berendt. 1 Bd.; 2 Abth. Berlin, 1854.

Systematisches Conchylien-Cabinet von Martini und Chemnitz. Von H. C. Küster. 3 Bd. Heften 15, 16, 17.

Icones Zootomicæ. Herausg. Von J. V. Carus. 1ste Hälfte.

London Journal of the Society of Arts, vol. v. Nos. 241-245. From the Society.

Catalogue Raisonné of the Medical Library of the Pennsylvania Hospital. By E. Fischer, M. D. From the Managers of the Pennsylvania Hospital. Philadelphia, 1857.

Memorial of the Inauguration of the Statue of Franklin. From the City of Boston.

Report of the Commissioner of Patents for the year 1856. 3 vols. From the Commissioner.

December 8th. The following were presented by Dr. T. B. Wilson on the usual conditions:

Proceedings of the Somersetshire Archæological and Natural History Society, 1851, 1852, 1854.

De danske Østersbanker of Henrik Krüyer. Kjöbenhavn, 1837.

Einige Beobachtungen und Reflexionen über die Skelettsysteme der Wirbeltiere deren Begrenzung und Plan. Von Dr. C. Bergmann. Göttingen, 1846.

De Plumarum Pennarumque evolutione disquisitio Microscopica. Scripsit C. Reclam. Lipsiæ, 1846.

Ausführliche Naturgeschichte des Thier-, Pflanzen- und Mineral-Reichs. 2 Bdn. Breslau, 1843. Presented by S. Schilling.

Revisio critica generis Ichneumonis specimen. Auc. J. J. Trentepohl. Kiliæ, 1825.

Diss. inaug. Med. sistens Myologiæ Insectorum, etc. Auc. Dr. F. G. L. Succow. Heidelbergæ, 1813.

Diss. inaug. de Cloaca. Auc. F. Haag, Bernensis. Turici, 1837.

Diss. inaug. de Hydatibus. Submit. H. O. L. Lüdersen. Göttingæ, 1808.

Observationes Anatomicæ de Uteri Vaccini Fabrica. Auc. A. Burckhardt. Basileæ, 1834.

Geological Sketches and Observations on Vegetable-fossil Remains. By Chas. Clay. London, 1839.

The Physiology of Digestion. By A. Combe, M. D. Edinburgh, 1841.

Lehrbuch der Zoologie. Von J. F. A. Eichelberg. 1 Bd. Zürich, 1842.

J. und K. Menzel's Bemerkungen über die Struktur der ausgewachsenen Schwung und Schweif Federn. Tübingen, 1807.

Observationes Anatomicæ de corde Testudinis Marinæ Mydas dictæ collectæ et cum corde humano collatæ. H. A. Wrisbergii. Göttingæ, 1808.

De Ascidiarum Structura. Subjicit H. F. Schalck. Halæ, 1814.

Supplementa ad Anatomiam et Physiologiam potissimum comparatam edita A. C. H. Dzondi. Lipsiæ, 1806.

Essai sur l'Histoire Naturelle des Roches. Par. M. de Launay. Paris, 1786.

Prodromus Monographiæ Castniæ, generis Lepidopterorum. Auc. J. W. Dalman. Holmiæ, 1825.

The Mineralogy of Derbyshire. By Jno. Mawe. London, 1802.

Histoire Naturelle des Volcans. Par. C. N. Ordinaire. Paris, 1802.

A Mineralogical description of the County of Dumfries. By R. Jameson. Edinburg, 1805.

- Skeletogenie. Von K. A. F. Otto. Würzburg, 1831.
 An Analysis of the Natural System and its application to the Mineral Kingdom. Travels in the interior of Brazil. By J. Mawe. London, 1812.
 Traité ou Description abrégée et Méthodique des Mineraux. Par. Prince Gellitzin. Mæstricht, 1792.
 A Geological Inquiry respecting the Water-bearing Strata of the Country around London. By J. Prestwich. London, 1851.
 Views of the Mineralogy, Agriculture, Manufactures and Fisheries of the Island of Arran. By J. Headrick. Edinburgh, 1847.
 Insektologische Terminologie. Von G. B. Schmiedlein. Leipzig, 1789.
 Lithophylacium Mitisianum. A. F. Güssmann. Viennæ, 1785.
 Naturgeschichtliche Reisen durch Nord-Afrika und West-Asien. Von Dr. W. F. Hemprich und Dr. C. G. Ehrenberg. 1 Bd. 1 Abtheilung. Berlin, 1828.
 Riflessioni sopra il Sistema Linfatico dei Rettili. Di Manro Rusconi. Pavia, 1845.
December 15th. Presented by Dr. T. B. Wilson, on the usual conditions:
 Essais sur les Isles Fortunées et l'antique Atlantide. Par. J. B. M. Bory de St. Vincent. Paris.
 Istoria Narrazione de principali fatti che promossero e seguirone e confermarona anco con autorevoli stampati Guidizii del Dott. G. Rivelli. Fano, 1845.
 Esposizione di due Vescichette di Graaf semi-retrovariche una di donna e l'altra di Vacca. Del Dr. G. Rivelli.
 Additamenta ad Georgii Augusti Pritzellii Thesaurum literaturæ Botanicae. Col. et Comp. E. A. Zuchold.
 Journal of an Embassy from the Governor-General of India to the Courts of Siam and Cochin China. By J. Crawford. London, 1828.
 Aanmerkingen over den Oorsprong, Gesteltheit, en Aard der Zee-Wormen. Door Den Hr. Rousset. Leyden, 1733.
 Diss. inaug. Anatomiam suis scrophæ. Tübingæ, 1820.
 Stone Steps. A stratigraphical arrangement of the British Geological Formations. By J. Buckman. London.
 Ai Cultori delle Scienze Naturali. Parma, 1838.
 Diss. inaug. de Vermienn intestinalium prima origine. Auc. J. A. Braun.
 Monographia Tanypodum Sveccia. Auc. B. F. Fries. London, 1823.
 Die Paukenhöhle der Säugethiere. Von E. Hagenbach. Leipzig, 1835.
 Beiträge zur Kenntniss der Geschlechts-verhältnisse und der Samenflüssigkeit wirbelloser Thiere. Von A. Kölliker. Berlin, 1841.
 Zoologische Abhandlungen aus den Annalen des Wiener Museums der Naturgeschichte. 1 und 2 Bds., 1 und 2 Abtheil. Wien, 1841.
 Mollusques Méditerranéens. Par. J. B. Verany. 1ère partie. Céphalopodes. Gênes, 1851.
 Museum der Naturgeschichte Helvetiens Herausg. Von F. Meisner. 1 Bd. Bern, 1820.
 J. P. Breynii Historia Naturalis Coci Radicum Tinctorii. Gedani, 1731.
 Lehrbuch der Mineralogie. Von L. A. Emmerling. 1er Theil. Giessen, 1793.
 The Undercliff of the Isle of Wight. By G. A. Martin. London, 1849.
 Histoire de la Grande Isle Madagascar. Par. De Flacourt. Paris, 1661.
 Die Versteinerungen der Grauwack-enformation in Sachsen und den Angrenzenden Läder-Abtheilungen. Von H. B. Geinitz. Heft. 2. Leipzig, 1853.
 Prodromus Historiæ Generationis Hominis atque animalium. Auc. R. Wagner. Lipsiæ, 1836.
 Essai d'employer les Instruments Microscopiques avec Utilité et Plaisir dans la Saison du Printems. Nuremberg, 1763, (German and French.)
 Notizie sulla Moltiplicazione in Firenze Negli Anni 1837-9 deel uccello Americano Patolaria Cucullata Chiamato Volgarmente Cardinale dal Dr. C. Passerini Firenze, 1841.

- Diss. inaug. de Evolutione Strongyli Auricularis et Ascaridis acuminata viviparorum. Auc. H. Bagge. Erlangæ, 1841.
 C. Mayer de Organo Electrico in Râis anelectricis et de Hæmatozois. Bonnæ, 1843.
 De Pancreato Piscium. Auc. H. Brockmann. Rostochii, 1846.
 Die zweiflügligen Insecten von ärztlichem Gesichtspunkte ans betrachtet. Von J. Hensler. Freiburg, 1845.
 Die Versteinerungen der Fische und Pflanzen im Sandsteine. Von H. A. C. Berger. Coburg, 1832.
 Kleine Beiträge zur Naturgeschichte der Infusorien. Von L. K. Schmarda. Wein, 1846.
 De Echinorhyncho Polymorpho Bremseri. Auc. E. T. Jassory. Herbipoli, 1820.
 Beschreibung und Untersuchung des Monostoma Bijegum. Von Dr. Fr. Fischer. Basel, 1838.
 Beiträge zur Monographie der Pteromalinen Nees. Von A. Foerster. Aachen. 1841.
 December 22d. Mémoires de la Société des Sciences, de l'Agriculture et des Arts de Lille. Année, 1847. 1et 2 Partie; 1848, 1852, 1853, Supplémenta 1853. 1854, 1825, 1856. From the Society.
 Canadian Naturalist and Geologist. November, 1857. From the Editors.
 Proceedings of the Boston Society of Natural History, pp. 271 to 272. From the Society.
 Proceedings of the American Atiquarian Society at the Annual Meeting, held in Worcester, Oct. 21, 1857. From the Society.
 Canadian Journal of Industry, Science and Arts, November, 1857. From the Editors.
 Histoire physique, politique et Naturelle de l'Ile de Cuba. Par. Ramon de la Sagra, 78, 79 and 80th Livraisons. From Wm. S. Vaux.
 Proceedings of the Royal Society of Edinburgh. Session 1856-7. From the Society.
 The following were presented by Dr. T. B. Wilson, on the usual conditions :
 Bulletin mensuel de la Société Impériale Zoologique d'Acclimation. Octobre, 1857.
 Revue et Magasin de Zoologie, 1857. No. 9.
 Comptes Rendus, t. 45. Nos. 15-18.
 Annals and Magazine of Natural History, November, 1857.
 London, Edinburgh and Dublin Philosophical Magazine, November, 1857.
 Die Natur, 1857. Nos. 36-40.
 Kosmos. Nos. 8 and 9.
 Palæontographica. 5 Bd., 2 Lief. 6 Bd., 2 und 3 Lief.
 Monograph of the Trochilidæ. By Jno. Gould. Parts 13 and 14.
 The Birds of Asia. By J. Gould. Part 9th.
 The Mammals of Australia. By J. Gould. Part 9.
 J. Cypriani Historiæ Animalium. Lipsiæ et Francofurti, 1688.
 J. J. Lubecensis Historia Sermium. Hamburgi.
 J. C. Kuhlemanni Observationes quædam circa Negotium Generationes in Ovibus Factæ. Lipsiæ, 1754.
 De Locustis. A. C. Brange. Jenæ, 1693.
 Exercitat. Med. de Harengo. P. Neucrantzi. Lubecæ.
 J. Reiskii de Glossopetris. Lipsiæ, 1684.
 Nomenclator Entomologicus. Stralsund, 1785.
 Examination of the objections made in Britain against the Doctrines of Gall and Spurzheim. By J. G. Spurzheim. Edinburgh, 1817.
 Einiges über den Blutegel. Von Dr. Fr. Sigism.
 Trilobites des Geognostischen Sammlung. Von F. W. Hoeninghaus. Crefeld. 1848.